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CONTENTS

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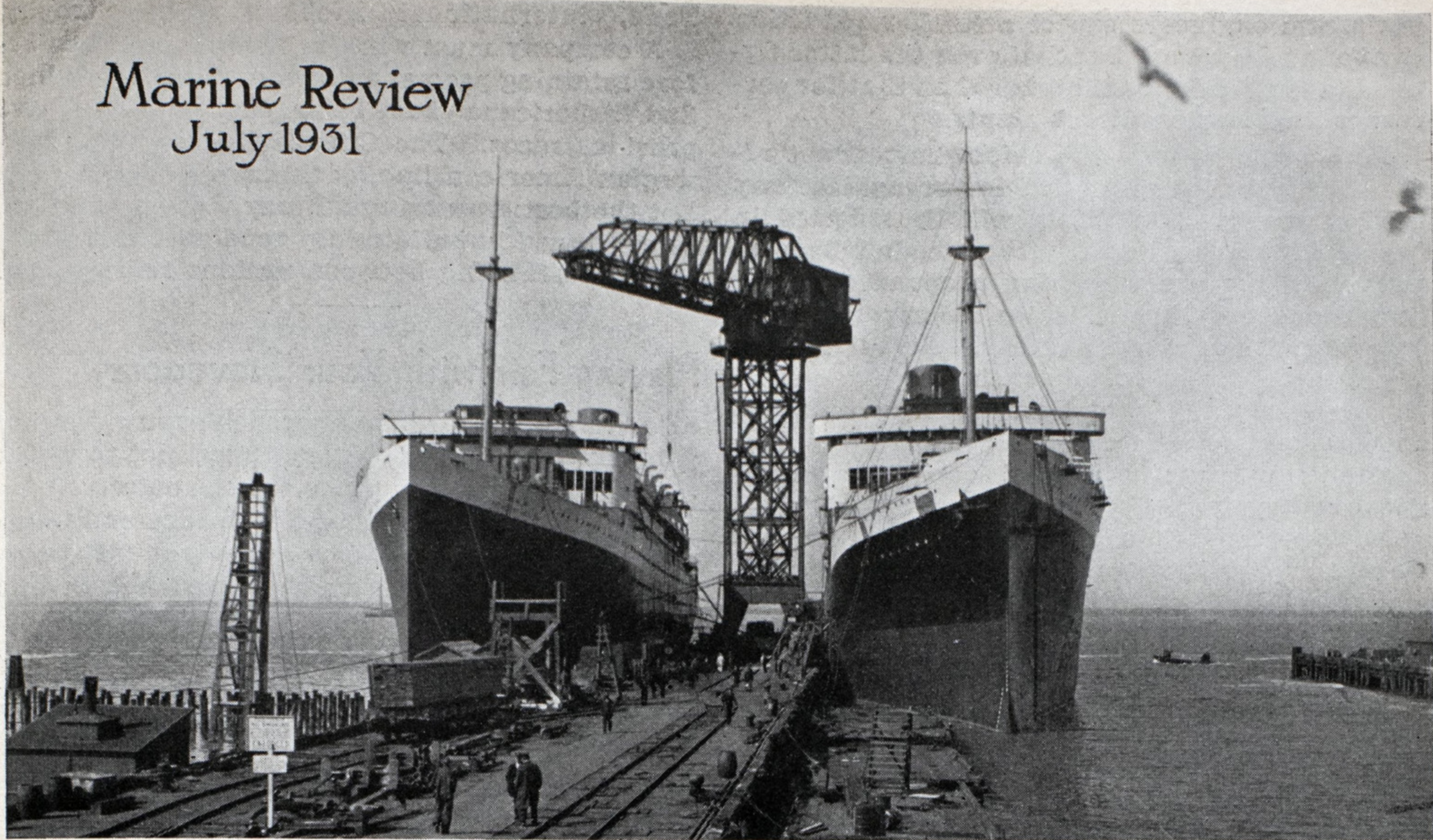
	Page
Editorial	13
Urges United Efforts in Support of Merchant Marine..	15
United States Senator Wesley L. Jones	
By Robert C. Hill	
Passenger Trade on North Atlantic—Part II	16
By W. L. Harms	
New Freight, Mail and Passenger Service	18
Renaissance of Old Ironsides	19
By Commander Louis J. Gulliver	
Launch First New Matson Liner in July	21
S.S. President Hoover Exceeds Guarantee on Trials....	22
Lighthouse Service—Recent Developments in	23
Maritime Law—Late Decisions	24
By Harry Bowne Skillman	
Ports—Marine Business Statistics Condensed	25
Load Line Legislation Discussed	27
By Norman F. Titus	
New Construction Ordered and Contemplated	28
Bunker Prices—Foreign and Domestic	30
Tank Cleaning—New System of	31
By L. E. Browne	
Up and Down the Great Lakes	32
Bulkhead Doors, Elevators—Electric Control	34
Turbine or Diesel Drive in Stern Wheel Towboats.....	35
Welding—Importance of in Shipbuilding	36
Stokers Installed in River Towboats	37
Equipment Used Afloat and Ashore	38
Giant Gate Lifter for Welland Canal Tested	41
Stevedoring and Dock Management Progress	42
Pier Layout and Equipment for Economical Transfer	
By H. E. Stocker	
Terminal at Portland in Full Operation	
By A. H. Morrill	
Safe Stowage Essential to Efficient Operation	
By H. A. Rhatigan	
Useful Hints on Cargo Handling	47
Personal Sketches of Marine Men	48
Calvin Austin, Retired Chairman, Eastern S.S. Lines	
Distributing Base for Water Transportation	52
What the British Are Doing in Shipbuilding	54
Books—Late Marine Reviewed	56
New Trade Publications	58
Business News for the Marine Trade	58

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New Dollar Liners President Coolidge and President Hoover at Yard of Newport News Shipbuilding and Dry Dock Co., Newport News, Va.

« EDITORIAL »

Future of the Diesel Engine in Propelling Ships

THE recent performance of steam vessels has been much improved and the publicity has been widespread. The results accomplished, for instance, with the Duchess class, the EMPRESS OF JAPAN and lately the even better performance of the EMPRESS OF BRITAIN, have received acknowledgement the world over and are known by shipowners, operators and engineers everywhere. Nothing comparable to this has been heard of from the diesel engine in recent years. Steam advocates are now in a comparatively complacent mood as indicated by the statement in a recent article in one of our leading British contemporaries to the effect that "Six tenths pound of oil per shaft horsepower per hour for all purposes is attainable and maintained in present day steam engineering. As this on cost is distinctly better than can be obtained for diesel propulsion, there is no immediate urge to improve upon it and the tendency is rather to gain experience with the already large number of existing installations before ad-

vancing further." What does the diesel engine advocate have to say in the face of such assurance?

The managing director, Dr. H. H. Blache, of Burmeister & Wain, whose success and experience in the building of marine diesel engines cannot be questioned, in a recent paper before the Institution of Naval Architects in which actual operating results are given, is of the opinion that at the present stage of the marine diesel engine, it is adaptable for all types of ships from a 35 horsepower engine in fishing craft to a 20,000 horsepower plant as installed in the motorship BRITANNIC. He believes that the diesel engine should be adopted when burning oil and the steam engine, when burning coal. All progress in the higher economy of coal consumption and the easier handling of coal which add to the competitive power of coal fired steamers as against diesel engine ships, Dr. Blache believes should be viewed with the greatest interest in a coal producing country, but he cannot understand why the advocates of steam generated by oil seem to be equally favored. He goes on to point out the improvement in the economy of oil fired steam plants to 0.65 pound per brake horsepower per hour for steam driven plants of fast running passenger liners and that lead-

ing steam engineers expect a further reduction to about 0.56 pound, but that even the latter figure is about 50 per cent higher than that for corresponding marine diesel plants.

As a business man the shipowner cannot afford to have any prejudice for or against any type of power. His ability will be reflected in basing decisions on fact. He shouldn't have to wait until the overwhelming preponderance of evidence clearly demonstrates the superiority of one type of drive over another. Actual operating data on diesel vessels such as given in the paper referred to, ought to be readily procurable and easily checked for accuracy.

Admitting equally careful design, material and construction, the question as to the choice of power would then depend upon the circumstances surrounding each case. Even if no engineer can be found who is entirely unbiased, the decision as to choice would rest with the owner who is primarily interested in financial returns. Under such circumstances, depending upon conditions of service, diesel or steam would be selected as each clearly had the advantage.

For American operators to ignore the diesel, is a short-sighted policy. History sometimes has a way of repeating itself. When England first started using steam, Americans were slow to follow, clinging to their belief in the economy and superiority of sail. Had the American shipowners of that day taken steam more seriously we may never have reached the low state of insignificance as a merchant marine power. The lesson is clear. Be open-minded to all facts in regard to improved methods of propulsion and consider carefully what Britain and other maritime powers are doing with the diesel engine.

Annual Lifeboat Races

WHEN all practical analysis is done, the fact remains that man cannot live on bread alone. The spirit must get some nourishment, even for effectiveness in material things.

New York is a great international port. Men of all races who follow the sea meet here on common ground. It is therefore, appropriate that the annual lifeboat race should be held here. Competition is keen. The crack ships and crews of all lines are to be found here.

Preliminary arrangements for the fifth annual lifeboat race to be held on Labor day are now being drawn up by Capt. John F. Milliken of the Neptune association which sponsors these races. The tentative rules are the same as last year. Lifeboats must be at least 26 feet in length overall and 7 feet beam. The crew will consist of eight men and coxswain and the course will be two miles long on the Hudson river. One lifeboat may be entered from each ship of any steamship company. The prize to be contested for is known as the Commodore William H.

Todd, international lifeboat racing trophy.

A company must win the race three times before retaining permanent ownership. The Linea Sud Americana has been successful in two previous races. The Cunard line and the Norwegian American line, each have won one race. Let the best crew win and may this annual race be continued in building up good will and a better understanding between nations represented.

Playing Fair with Your Stevedore

IF A ship operator is to approach even a passing mark of profit in ordinary times, not to speak of unusually poor times, every detail of his operations must be watched with care and intelligence. One of the most important of these operations is the turnaround in port and in this turnaround, stevedoring is one of the chief items of expense. The shipowner and operator who studies the problems of his stevedore with intelligence, will save expense.

The stevedore is in a peculiar position, as he must deal directly with the officers on the ship he is loading or discharging and also with the steamship company by whom he is employed. It is easy to fall into the wrong attitude of considering the stevedore a necessary evil, to tolerate and, not infrequently to quarrel with. The able ship operator realizes that a competent and financially responsible stevedore is an important factor in successful steamship operations. The steamship owner and operator is dependent on the stevedore for the correct stowage of cargo at minimum cost. Driving too hard a bargain with your stevedore may be costly.

With understanding of all the difficulties involved, close co-operation will produce the best results. A competent stevedore will be quick to appreciate such an attitude and will meet the ship operator in the same spirit by improving his gear and methods of operation. Such improvement will be based on his skill and practical experience in cargo handling and safe stowage. There are many instances of the discovery of better ways to do things than the customary or usual way when this close co-operation exists between all parties concerned. Criticism and fault-finding can only do harm unless based on a practical understanding of the problem.

Everyone is worthy of his hire, not excepting the stevedore. To subject him to unfair competition in determining compensation is not a sound policy. Though temporarily it may seem to save something in the cost, the quality of the work is bound to suffer and any apparent savings will not only be wiped out, but greatly exceeded by the losses due to claims for damage and the additional cost on the other end due to improper stowage. Even the safety of the ship may be endangered by hurried and careless work on the part of the stevedore working under the handicap of unfair rates of pay.

Urges United Efforts of All Groups

In Support of the Merchant Marine

By Robert C. Hill

It is a mistake to look upon our merchant marine as something not particularly necessary for the country's welfare. Foreign flag ships carry great quantities of American merchandise and will continue to do so for we are only aiming at a reasonable share of the traffic.

Senator Jones thinks we should have learned these lessons during the war. There must be no let-up in the fight he so ably helped to lead for wise legislation favorable to the continued up-building of an efficient American merchant marine. Strengthening of the present legislation is needed.

Editor's Note.



U. S. Senator Wesley L. Jones

IN THE valhalla of marine men, United States Senator Wesley L. Jones will surely be given a place of honor, though he is not, strictly speaking, one of them. The senator from Washington was born in Bethany, Ill., Oct. 9, 1863. Even his early youth was spent inland. When he did go west he settled down in the central part of Washington, an agricultural territory. In 1917 he moved to Seattle, his first close sea contact.

Nevertheless no man in public life has been more consistently or more effectively a supporter of the merchant marine. "Of what benefit is a balance of trade in our favor," he asks, "if we pay most of it for freight?" He has always recognized the necessity of an American merchant marine as a safeguard for our foreign commerce and for national defense.

Knowing that his early life had been spent in the interior, I was curious to know the reason for his strong friendship for the merchant marine. He explained it thus. "My first interest was aroused many years ago by reading the history of the Revolution and the War of 1812. Ships under our own flag are not only vital to commerce, but particularly so in time of emergency as a national defense. England's supremacy on the high seas always appealed to me as an incentive to build our merchant marine. Coming from inland I have always been convinced that an adequate merchant marine is really of greater moment to the farmers and people of the interior than to those residing on the coast. Wasn't this demonstrated during the World war? If we do not have ships to carry the surplus products of the farm, doesn't the agricultural population suffer?"

One of the three oldest senators in point of service, he has taken a prominent part in shipping legislation since he entered the Senate in 1909. His name will forever be closely identified with the merchant marine act of 1920 and the act of 1928, known as the Jones-White bill. Of the last two laws which he worked for with untiring energy, Senator Jones said:

"If there are two pieces of legislation that I am proud of having had something to do with, it is these two acts.

These two measures have gone a long way toward laying the foundation for an adequate American merchant marine. This merchant marine, however, is not yet permanently and adequately established. We must not weaken the acts that we have already passed; if anything, they should be strengthened. The lessons learned from our condition upon the breaking out of the World war should not be forgotten and the experience that we passed through should be enough to lead our people to do whatever may be necessary for the firm establishment of an adequate and permanent merchant marine. I think this is about as vital a necessity as confronts our people. At least 50 per cent of our foreign commerce should be freighted in our own vessels."

He is gratified at the aid given American lines by mail subvention, but there is danger ahead and Senator Jones warns friends of the merchant marine that eternal vigilance is necessary to hold the ground already gained. He senses a growing sentiment in congress in opposition to government aid for shipping. He sees intense opposition and competition from foreign shipowners who are alarmed at the advances being made by the United States. That opposition through our present program should rear its head within our own ranks, is regarded as a most unfavorable sign by the veteran senator.

"It would be most unfortunate," he said, "if we should abandon our present policy toward the merchant marine. We have made a splendid start but we had to begin at the ground and build up. We can well afford to assist private interests in their efforts to develop an adequate commercial fleet. Our merchant marine faces a heroic struggle in meeting the competition of foreign flags without having to fight at home. Our ships ought to be placed on a parity with foreign ships. We must not give up."

Senator Jones is completing his fourth successive term in the upper house. As chairman of the powerful committee on commerce, he made the most of his influential position to sponsor much of the merchant marine legislation over the last decade. He is now chairman of the all important appropriations committee.

Passenger Trade on North Atlantic

World's Greatest Ferry—Ever More Speed and Luxury Demanded, Advancing Shipbuilding — Pre-eminence Here is an Accolade of Highest Merit

Part II
By W. L. Harms

SATISFACTORY as was the giant intermediate liner in the scheme of transatlantic traffic, the shipping companies could not get around the fact that it was the express steamer that created prestige for the line and furthermore received particular consideration in the dispatch of the mails. These considerations led to the introduction of a class of steamships of immense proportions and capacity for passengers (but not for cargo, no more than a limited amount of this being provided for, as in greyhound steamers), which were further powered to a speed not far below that of the record holders. The pioneer in this respect was the White Star line, which had indeed been the leader in the development of the intermediate liner.

Comfort and Luxury

From 1911 to 1914, then, there were brought out the OLYMPIC, the TITANIC, the IMPERATOR, the VATERLAND, and the AQUITANIA. The BRITANNIC and the BISMARCK were still under construction at the outbreak of the World war; the former was destined to be lost in the course of the conflict and the latter not to be completed until after the war. These seven superliners rated at from 22½ to better than 24 knots, and registered at from 45,000 tons to 56,000 tons gross; in size they have not yet been exceeded. Their proportions enabled the steamship lines to attain new extremes of comfort and luxury for the passenger.

The war of course played havoc

This is the second and concluding part. The first appeared in the June issue.

with the Atlantic ferry. The German lines were forced to discontinue operations altogether, while the fleets of the others were extensively drawn upon by their respective governments for national service. And travel was naturally discouraged by the circumstances.

Following the close of the war, not till 1922 was the transatlantic service restored to normal. One element of it, however, had undergone a radical change.

One of the first cares of the steamship companies, probably the very first, upon the conclusion of hostilities, had been to prepare themselves to take advantage of the great rush with which emigration from Europe to the United States was due to be resumed. As many important vessels had been lost in the war the lines placed orders for the construction of a number of new steamships.

The Cunard-Anchor associated companies, whose fleets had suffered severely, committed themselves in particular to an extensive program, providing for no less than twenty new intermediate liners ranging in size from 12,000 to 20,000 tons, at 15 to 17 knots speed.

In addition the British, American, and French lines acquired such of the liners surrendered by the Germans as were suitable for their purposes. The United States shipping board, in establishing the new American transatlantic service now known as the United States lines, planned to build it up for the most part of the largest of the ex-German liners in its possession.

An interesting feature of these activities was that while these addi-

tions to the transatlantic fleets were in general intended to accommodate first, second, and third class passengers in conventional ratios, several ships were fitted solely for third class, that is, emigrant passengers. Such were the new MOUNT CARROLL and MOUNT CLINTON together with the ex-German MOUNT CLAY of the United American lines, as also the VEDIC, RIMOUSKI, and MINNEKAHDA of the International Mercantile Marine system. While the others were vessels of under 10,000 tons, the MINNEKAHDA was a notable case in respect of her great tonnage of over 17,000 gross, though there had been a precedent just before the war when the 14,000-ton greyhound KAISER WILHELM DER GROSSE was remodeled for that same purpose.

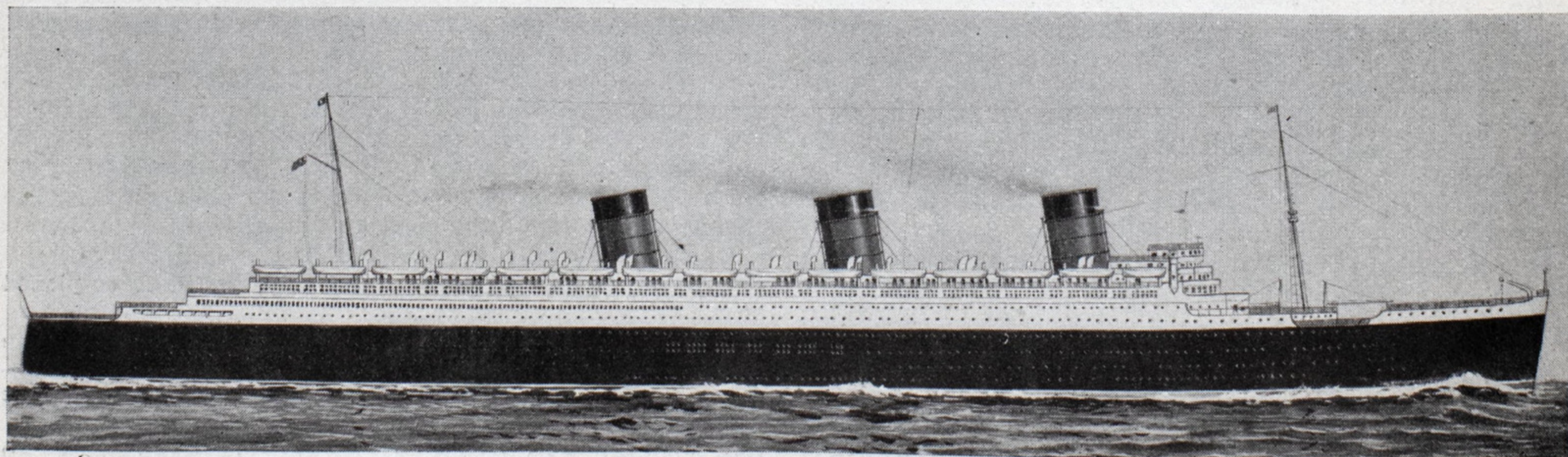
Large Increase In Immigration

The expected rush of emigration was indeed materializing, rising from the wartime nadir of 100,000-odd for the year 1918 to 800,000 for 1921 (the "years" of course always representing the United States government fiscal years, ending June 30 in the corresponding calendar years).

Then came the blow! On May 19, 1921, the President's signature confirmed as law a bill to restrict the rate of immigration to the United States roughly to 3 per cent annually for each nationality of the number of residents of that nationality reported in the census of 1910. This law was in force three years.

Through that period there were 300,000 admissions for 1922, but well over 500,000 for 1923, rising to 700,000 for 1924.

In this last year the law of 1921



Drawing of New Cunarder—Building at John Brown's, Clydebank, Scotland. Length 1018 feet—Speed Estimated, 32 Knots

was succeeded by the immigration act of 1924, enacted May 26, which is the law in effect at present. Restriction has been carried still further, limiting the annual rate of admission of immigrants to 2 per cent of the number of persons of the respective nationalities resident in the United States in 1890, as per that census.

Thereafter the annual rate of immigration remained in the neighborhood of the 300,000 mark for the years 1925 to 1928 inclusive. For 1929 a slight drop was registered, to 280,000 admissions, and for 1930 a rather greater one, to 240,000. For 1931, however, the admissions will not exceed 155,000, according to the government forecast.

This restriction of immigration put the steamship lines in an uncomfortable position with their many emigrant carriers in commission and under construction. Some of the former had to be disposed of and work on some of the latter halted, though these last were destined to be completed eventually.

How To Use Third Class

A pretty problem it was that confronted the shipping companies—what to do with the considerable third class accommodation in their steamers that was now rendered superfluous.

A plan was shortly developed. It was reasoned that among that great section of the American population comprising persons of moderate means it might be possible to cultivate a new source of patronage to offset to some extent the shrinkage in the emigrant traffic. The plan was specifically concerned with professional workers—physicians, school teachers, university professors, as also students—potential vacation travelers that were not generally prepared to incur the expense of ocean voyaging in first class or second class. It was hoped that these would be receptive to the offer of the superfluous third class accommodations at a trifling increase over third class fares in return for due consideration for the traveling standards of such patrons.

Accordingly there was inaugurated

in 1924 a new class of passenger accommodation on the Atlantic, under the style of tourist third cabin. In deference to cultural considerations this was kept altogether distinct from third class; indeed it impressed those who sampled it as being a less expensive and delightfully informal variety of second class travel.

Tourist Travel Increases

The results were gratifying. Each year saw a decided increase in the number of passengers carried in tourist third. According to a recent statement by an official of one of the companies the annual rate has risen steadily from a few hundred over 15,000 for the calendar year 1924 to not quite 300,000 for 1930, quoting the totals for all the Atlantic steamship lines.

The idea is spreading to other routes of the world. It has appeared in the transpacific trade, and is being introduced in the services from Europe to the Orient and Australia. On the Europe-South America run there has existed for quite a time a type of transportation known as economic second class, which cannot be far different in theory from tourist third.

The trend of postwar travel across the Atlantic has indeed been emphatically toward middle class transportation. This has been represented in the rise of the cabin liner.

Prior to the war it had been the rule in designing passenger steamers to provide at once for all three classes of accommodation—first, second, and third. Since the war, however, first class has been omitted in the majority of the transatlantic steamships, being retained only in the express steamers and a certain few of the intermediate liners. The steamship companies themselves prefer to put it that first and second class have been combined into what has become known as cabin class, at fares on a scale slightly above that for second class. The absence of first class barriers renders accessible to the cabin passenger, of course, the ship's finest appointments.

At first the cabin steamers were built to just middling size and moderate speed. In the course of time,

however, they were joined by the bulk of the intermediates of prewar build, including such giants as the ADRIATIC and the GEORGE WASHINGTON. It was becoming difficult for them to attract first class passengers in the face of the luxury and prestige of superliners of the OLYMPIC type.

It will be observed that where first class was discontinued in these older ships the arrangement was particularly attractive to middle class travelers, for the recent first class accommodations were now devoted to cabin service, while tourist third got the benefit of the former second class quarters.

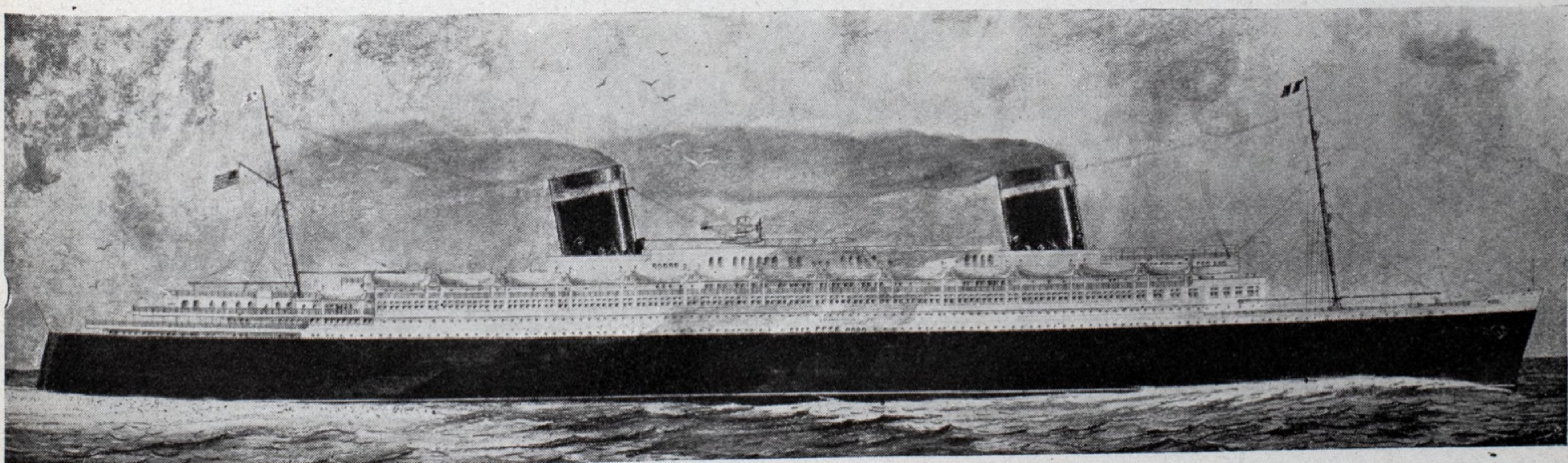
Though it has been only following the war that the cabin liner has been developed, it is not absolutely a new institution. Already in 1910 or thereabouts first class was discontinued by the American line and the Hamburg-American line on several of their ships. Farther back, at the beginning of the century, we have the newly-built RHEIN, MAIN, and NECKAR, of the North German Lloyd, providing for passengers only in second and third class. Older precedents are doubtless to be found.

Vessels Altered for Tourist Trade

Tourist class passengers have also been relieved of barriers aboard ship in quite a few cases, not merely of those of first class, but of second or cabin class as well. Already in 1924 the big MINNEKAHDA was transformed from an exclusively third class carrier to an exclusively tourist liner. She was supplemented after a time with the WINIFREDIAN, DEVONIAN, and MINNESOTA, old ships of 10,000 to 13,000 tons that had already been demoted from first class liners to cabin liners, previous to being devoted now to tourist service; these three have since been retired from operation.

For newer steamers there are the smaller but excellent American Merchant liners put on the New York-London run as fast freighters early in 1924 by the United States shipping board and subsequently fitted for tourist passengers. These ships are now part of the United States lines fleet. Perhaps the most striking examples are the Red Star liners PENNLAND and

(Continued on page 50)



Drawing of Proposed United States Superliner. Preliminary Plans Ready. Nothing Being Done Awaiting Action of Congress

To Inaugurate Freight, Mail and Passenger Service

WITH the sailing of its flagship the CITY OF BALTIMORE on July 2 from Baltimore, the Baltimore Mail Steamship Co. will inaugurate a fast freight, mail and passenger service between Baltimore, Hampton Roads, Havre and Hamburg. The CITY OF BALTIMORE underwent her trial tests on May 28 and successfully met the requirements laid down for her. During these tests, which were made between Ambrose light and Fire Island light off Sandy Hook, the vessel averaged 17.77 knots. On one of the runs, which were made under varying wind and tide conditions, the ship exceeded 18 knots. The mail contract calls for a speed of 16 knots.

The fleet of the Baltimore Mail Steamship Co. consists of five vessels, the CITY OF BALTIMORE, CITY OF NORFOLK, CITY OF NEWPORT NEWS, CITY OF HAVRE and CITY OF HAMBURG. These five steel cargo steamers were purchased from the shipping board for \$150,000 cash and were reconstructed at the yard of the Federal Shipbuilding & Dry Dock Co. at Kearny, N. J. with the aid of a construction loan of \$6,540,000 awarded by the shipping board July 11, 1930. The vessels are to be operated under the terms of an ocean mail contract.

Each of the five vessels will be 506 feet long, 56 feet beam and 24 feet draft. Displacement will be approximately 15,000 tons. The vessels were designed by Gibbs & Cox, New York city. Work on the four sisterships of the CITY OF BALTIMORE is going ahead according to schedule. The CITY OF NORFOLK, CITY OF HAMBURG and CITY OF HAVRE are all out of drydock. The CITY OF NORFOLK will be delivered about July 15 and will make her first voy-

age from Baltimore Aug. 13. The other vessels are scheduled to be delivered at monthly intervals.

Work of reconstruction on these vessels involves modification of hull lines and the installation of more powerful engines to increase their speed. The equipment of the new liners is of the most modern type. The engines are DeLaval cross compound oil burning turbines developing 9500 horsepower. They will be fitted with double reduction gears and steam will be furnished by four high pressure watertube boilers. Ten watertight bulkheads extend to the weather deck and divide each ship into eleven compartments, insuring maximum safety in event of flooding. Fire screen bulkheads are also installed with the Rich system of fire detection and automatic fire alarms in the passenger quarters. Modern navigating instruments to be installed in the vessels include the radio direction finder, the fathometer and the automatic gyro steering compass.

Staterooms are provided on the upper decks amidships for the accommodation of 81 passengers. The staterooms are attractively furnished. All of them are outside rooms and over half are fitted with private bath or shower.

During the trial runs of the CITY OF BALTIMORE the engines performed satisfactorily and despite her light draft it was said that the vessel was almost entirely devoid of vibration. Maneuvering the ship lasted for ten hours and included sharp turning angles, and forward and reverse running. Navigating instruments were also checked. After completing the trial runs the CITY OF BALTIMORE returned to drydock for final inspection and interior equipment. The vessel was delivered to the

owners about the middle of June.

Accommodations are provided on the ships for all types of cargo, such as lengthy steel, heavy machinery, bulk grains, ores and so forth. For perishable cargoes there are three large refrigerated compartments on each ship. The refrigerating unit is so constructed that separate temperatures can be maintained in each compartment, thus permitting accommodation of varied types of perishable cargo which may require different degrees of refrigeration. There is a reserve refrigerating unit on each vessel for use in emergency.

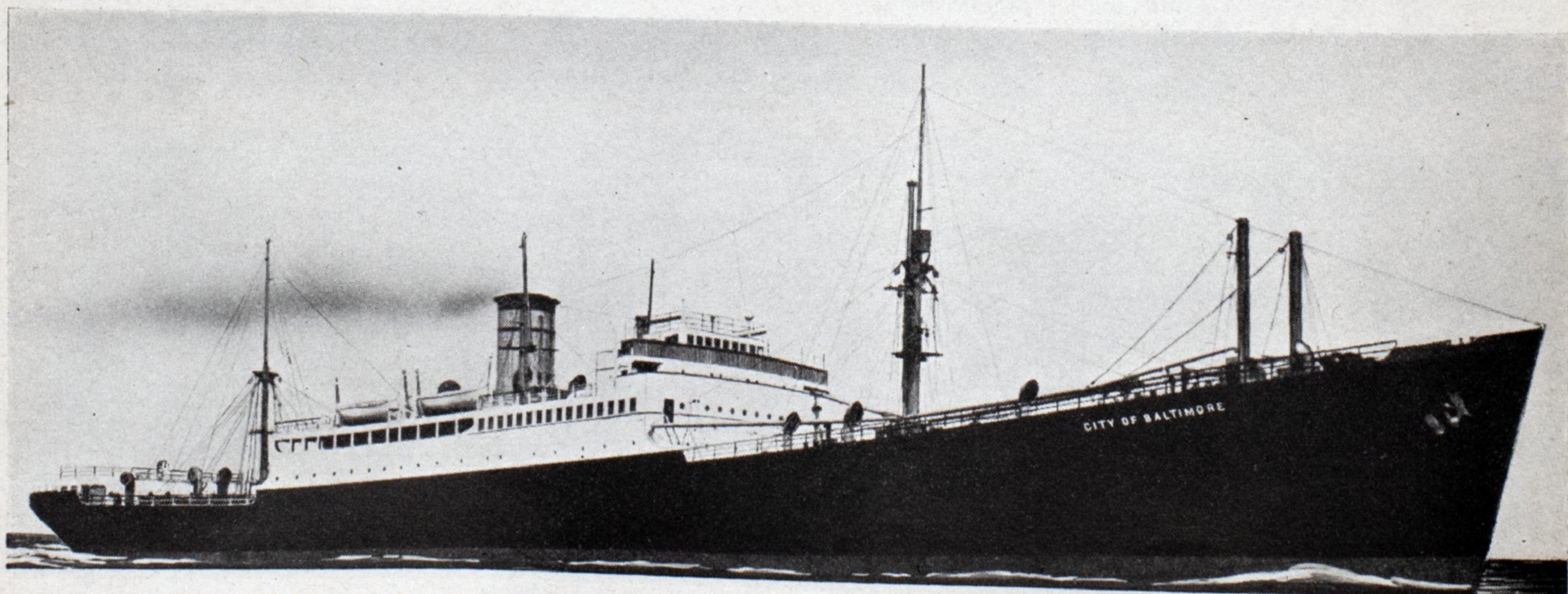
The Baltimore terminal of the line has direct rail connection with the large trunk line railroads entering the city. A new steel and concrete, double decked pier and warehouse has been built with ample provision for storage. The pier is 902 feet long and 90 feet wide. Modern cargo handling facilities permit speedy handling of cargo.

The Hamburg terminal is well situated for the interchange of freight and is equipped with modern cargo handling facilities. The other terminals of the line, Hampton Roads and Havre, are well equipped for transfer of freight from rail to ship.

By Oct. 15 the line will have established its regular sailing schedule with a ship leaving eastbound and westbound every week. The crossing from Baltimore to Havre will be made in nine days and to Hamburg in a little over ten days.

Officers of the Baltimore Mail Steamship Co. include: Donald Symington, president, John M. Franklin, executive vice president; Basil Harris, T. Archer Morgan, Kermit Roosevelt, and Henry E. Treide, vice presidents; William A. Grimes, secretary and Iredell W. Iglehart, treasurer.

The directors of the Todd Shipyards Corporation at their monthly meeting held in May declared the regular quarterly dividend of \$1 per share, payable on June 20, to stockholders of record at close of business June 5.



City of Baltimore, flagship of the Baltimore Mail line—One of five sisterships rebuilding at Kearny, N. J.

Renaissance of Old Ironsides

By Commander Louis J. Gulliver

A PROJECT in wooden ship reconstruction that had its inception seven years and six months ago is now within a few weeks of final completion. The United States frigate *CONSTITUTION* is about ready to be commissioned again as a ship of the American navy. Thus comes to an end an endeavor that has engaged the interest, the support, the good wishes, and the financial resources of very many thousands of men, women and children throughout the length and breadth of America.

Within a few days after the *CONSTITUTION* again flies, from her mizzen, the coach whip commission pennant, she will depart about July 3 on her cruise to the ports of her country. The first port to be visited is Portsmouth, N. H.—a singular coincidence, since it was from Portsmouth that the *CONSTITUTION* was towed to Boston some 38 years ago.

To go back a few years. In November, 1923, the navy department directed the naval board of inspection and survey to undertake a minute inspection of the *CONSTITUTION* with a view to rebuilding the ship to a good state of preservation and restoring her rigging and her exterior in approximately her original condition. This board recommended that she be rebuilt, refitted, and put in condition for preservation for the greatest length of time practicable for a seaworthy vessel.

The alternative, the board stated, was the loss of the *CONSTITUTION* to the nation; she would, unless rebuilt in the immediate future, go to ruin by reason of the rotting of her ribs, planking, knees and decks. The cost of the work recommended was thought to be \$400,000.

It is not too much to say that had the ship been allowed to remain afloat many more years, she would have collapsed from weakness in her vital members and sunk at her pier.

From this catastrophe the *CONSTITUTION* was saved by the action of congress. In March, 1925, the secretary of the navy was authorized to repair, equip and restore the frigate *CONSTITUTION* to her original condition. Further study and examination of her condition, convinced the officials of the

The author, Commander Louis J. Gulliver, United States navy, is prospective commanding officer of the *CONSTITUTION*.



United States frigate Constitution rebuilt at Boston navy yard

Boston navy yard that the cost of restoration would be not \$400,000 but \$650,654. This estimate necessarily was lacking in the essential detailed knowledge of the vessel's true condition; reliable plans were unobtainable; bills of material were incomplete and inexact; sources of material—live oak for example—were uncertain. In fact the success of the undertaking of restoration depended very largely on the procurement of suitable woods. In the 130 odd years since the *CONSTITUTION* was constructed, our forests have been stripped almost bare of the kinds of trees that furnished so generously the timbers, knees, planking and spars that went into the vessel at the time of her building at Hartt's shipyard in the north end of Boston in 1797.

Live oak timbers for the new framing were almost absolutely necessary. Where were they to be found? Almost providentially a supply was located immersed in Commodore's pond at Pensacola, Fla. The good luck that has always followed the *CONSTITUTION* was still with her in the matter of the precious live oak; the supply in Florida was sufficient in quantity and in suitable sizes. It had been placed there by slave labor in 1860.

Difficulty in procurement of live oak was paralleled in obtaining white oak; no less than 330 white oak knees were needed as replacements for the time wearied members of the original ship. They were found in Southern Delaware. White oak timbers and planks were searched for and found in West Virginia and Delaware.

The different parts of the nation to which the *CONSTITUTION* belongs had begun to contribute their individual products. Other States of the Union followed suit with donations of money or materials; often times with both.

Chronologically we have come to April 1927. The twelve months preceding this date had been used in searching for wood materials.

The next step—perhaps the most critical and dangerous moment of the *CONSTITUTION*'s career—was undertaken. "Old Ironsides" was placed on the operating table—in the language of shipbuilders, she was drydocked. This, at first glance, might seem to be an ordinary, routine piece of business. It was not. On the contrary, the removal of the *CONSTITUTION* from her natural element, the sea, and allowing her to rest on the solid ground of the dry dock gave rise to the gravest possibilities. There was no way of being sure that enough strength remained in the framework to support her when she settled on the keel blocks of the dry dock. It was known that weakness had already brought about a change in her original shape; she had become hogged, a sure symptom that decay in her strength members had progressed to a point of actual danger.

Special devices, cradles and a multiplicity of shoring were devised to make it almost literally impossible that any part could collapse. The dreaded dry docking was successfully accomplished.

Then began the labor of taking "Old Ironsides" apart. While the rotten frame was being removed the parts formerly supported by it must necessarily be held in place by other means. These required special devising; each operation requiring a different solution of a new problem. Thus almost one by one was each decayed part removed and in its place went virgin woods, adzed to the shape of the original; looking like the original; stronger than the original.

The alarming extent of the deterioration of the vessel will be realized when it is known that only fifteen per cent of the original ship was found strong enough to be retained in her construction.

The fifteen per cent that remains, contains, we feel sure, the soul of "Old Ironsides." That would be true if only

one per cent of her remained and 99 per cent were new.

No one who knows even a little of the restoration can write of this historical event, without giving voice to the credit that belongs to Lieut. John A. Lord, United States navy, who, at the inception of the work was placed in direct charge of the design, reconstruction, and research that have brought forth the finished product.

Lieutenant Lord, born and reared in the state of Maine, has given to the CONSTITUTION the best part of the past five years. Combining a rare practical ability as a builder and designer of wooden ships, with an equally rare creative makeup, he has carried forward the work of reconstruction with the infinite patience that goes with laborious research.

We have seen that congress in 1925 authorized the restoration of the CONSTITUTION. The money, however, for the work was to come from voluntary subscription. The magnitude of this task could scarcely be fully realized as the preliminary plans for raising the funds were inaugurated. It appeared at first that \$400,000 would be needed; later the first estimate had to be revised sharply upwards. First it was jumped to \$473,725, then \$650,654.

A vast business undertaking was involved in the raising of about \$650,000, through donations and the sales of pictures and souvenirs. A very sizable task was entailed in the distribution of prints of Gordon Grant's notable painting of "Old Ironsides." This picture was very popular; more than a million of them were distributed.

To systematize this work and to promote the publicity incident to it there was formed a national committee known as "Save-Old-Ironsides" committee. Of this Rear Admiral Philip Andrews, United States navy, commandant of the Boston navy yard and first naval district was chairman from October 1925 on. He labored prodigiously and with love and zeal.

In April 1930, congress appropriated funds supplementary to the amounts raised by the committee, and this enabled the work to go forward.

Aside from the actual labor of the rebuilding of the CONSTITUTION there has been the task of research into a thousand and one avenues that must be followed to ascertain the details of fittings, rigging, boats, galley, and general living conditions on board at the time of her greatest victories, 1812-14. This task has devolved on Lieutenant Lord and his assistants in the Boston navy yard. Many highways and by-ways in out-of-the-way corners of New England have been scoured in the endeavor to produce for us the exact atmosphere of 120 odd years ago.

Lieutenant Lord has been equal to this task. In fact it might be said that the restoration of the CONSTITUTION began when he was twelve years old. Then he knew and talked with aged sailors in Bath, Me., who as boys themselves sailed on her.

Up to the time this research was undertaken only meager knowledge was in possession of any one person as to the details that went into the vessel. Many years ago all the small and movable articles of equipment of the ship had been removed and subsequently lost or destroyed. The void caused by this was very great.

For example, when the restoration began all of the CONSTITUTION's guns had been removed and their whereabouts could not be ascertained. In the making of new guns it therefore was necessary to make careful and exact researches to determine the shape, size, bore, etc., of the CONSTITUTION's original guns. These consisted of long 24-pounders, bow chasers, and spar deck carronades. To go with these guns research had to be made of the gun rammers, gun sponges, cannon balls, rope matches, powder horns, powder bags, powder "kags," powder magazines, shell rooms. Exactitude in these was necessary and was attained.

In connection with the CONSTITUTION's original guns it is interesting to



Commander
L. J. Gulliver

note how research has indicated that about half of the 24-pounder guns used by her in 1812 were cast in England. The reproductions show the Royal English coat of arms on the upper surface midway between the touchhole and the muzzle.

With this coat of arms are the letters "G. R."—George Rex. It is thought that the guns used in 1812 had a short life; they were made of cast iron and probably soon became cracked and corroded. Research alone could determine the shape and materials of hundreds of other articles entailed in the restoration. For example, the harness casks for holding salt meats and salt fish; barrels for hard tack; hand and leg irons for recalcitrant sailors; cat-o-nine tails; the sick bay with its ancient mortar and pestle for pounding the herbs and roots to make drugs and medicines; the drinking water hogsheads, that is, scuttlebutt; the oil lamps that burned whale oil; the smoking lamp from which the sailors got light for their pipes; the boats—the pinnace, the gig and the whaleboats.

And now all this work is done. Done too are those lofty masts, rising heavenward—masts topped by topmasts and topgallant masts; crossed by graceful spars—yards—carrying courses, topsails, topgallant sails and royals. Extending from these yards are the tapering stunsail booms the counterparts of which bore the light stunsails for light air sailing.

Out from "Old Ironsides' stem, projects at the sharpest angle, the mighty bowsprit supporting at its outer part the jib boom that in turn holds steady the slender flying jib boom, all thrusting themselves ahead 74 feet.

The manner in which the CONSTITUTION fought and won sea fights for the young republic was unique; she fought in single combat—no sister vessels supported her. The manner in which "Old Ironsides" has been rebuilt and restored is likewise unique.

Three distinguished admirals of our navy have labored so that the restoration should be an accomplished fact. Two of these we have spoken of. Since June, 1930, Rear Admiral Louis M. Nulton, United States navy, commandant of the Boston navy yard and first naval district, has devoted himself untiringly to make this restoration complete.

Naval officers and men of more than a century gone manned the CONSTITUTION. She brought them safely through battle and storm. Naval men of 1931 will again man this ship. They will endeavor, in the ways given them, to maintain untarnished her traditions.

Certify Ocean Mail Routes

Responding to certifications received from the postmaster general, the shipping board on July 17 certified two new ocean mail routes with respect to the type, size, speed and other characteristics of vessels essential to the future development of the trades involved. The routes and requirements certified by the board are as follows:

Mobile, Ala., or other east Gulf of Mexico ports of the United States to the United Kingdom and other north European ports—Substitution of not less than 10 ships having a minimum of 4900 gross tons and at least 13-knot speed, at least four of such ships to be equipped with suitable refrigeration space to accommodate perishable cargoes. (The Mobile Oceanic line, sold by the shipping board but not yet delivered to the Waterman Steamship Co. of Mobile, operates a service covering this route.)

New York and/or other north Atlantic ports of the United States to Rotterdam and Antwerp—Substitution of not less than five ships having a minimum of 5000 gross tons and at least 16-knot speed to be equipped with suitable refrigeration space. (The American Diamond lines, sold but not yet delivered to the Black Diamond Steamship Corp. of New York, operates a service covering this route.)

Harland & Wolff, Ltd., members of the Royal Mail group, operating shipyards at Belfast and Glasgow, report a net profit for 1930 of £367,882, compared with £674,874 in 1929. Directors state that a plan for capital reorganization will be submitted to shareholders.

First of New Matson Liners to Be Launched in July

THE S. S. MARIPOSA, first of three modern superliners building for the Matson Navigation Co. of San Francisco, will be launched July 18 at the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass.

Mrs. Wallace M. Alexander, whose husband is vice president of the Matson line, chairman of the board of Alexander & Baldwin, Ltd. and one of the best known shipping executives in the Pacific area, will act as sponsor for the new ship. Water from the picturesque land-locked harbor at Sydney, Australia, Antipodean terminus for the big liner, will be used in the christening ceremony.

Several months behind the MARIPOSA, probably in November of this year, the S. S. MONTEREY, sister ship of the MARIPOSA, will be launched. Plans for the second launching have not been worked out. As soon as the MARIPOSA is off the ways in July, work will commence on a third Matson liner, the LURLINE, which will be a sister ship of the other two.

Under present plans, both the MARIPOSA and the MONTEREY will be commissioned into service over the historic Australia-South Seas route next year, the MARIPOSA in February and the MONTEREY shortly following. The LURLINE will not be available before 1933. Enroute to Australia and return the ships will call at Honolulu, Pago Pago, Samoa, and Suva, Fiji.

* This trio of new ships represents an investment of approximately \$25,000,000, each unit costing \$8,500,000. When completed, they will stand in the first rank of the world's finest ocean carriers. The MARIPOSA and MONTEREY are being equipped specially for service in the tropics and will combine the latest scientific devices that make for cool and comfortable transportation.

With construction being carried on under the provisions of the Jones-White act of 1928, all three vessels will be built to the rules and regulations of the American Bureau of shiping, and the United States steamboat inspection service, and, for watertight subdivision, they will conform to the regulations of the International Conference on Safety of Life at Sea.

The general particulars are as follows: Length overall, 632 feet; length between perpendiculars, 605 feet; beam, 79 feet; draft, 28 feet; displacement, 26,000 tons; guaranteed trial trip speed, 20½ knots.

There will be nine decks, 16 watertight compartments with double bottom throughout. The bulkheading arrangement is such that with any two of the largest adjacent compartments of the vessel flooded the ship

would still be able to remain afloat.

Each of the new liners will accommodate approximately 750 passengers, 500 first class and 250 cabin class. By using the same quality stateroom equipment in the tourist as intended for the first class, certain passageway doors may be opened to make the vessel all first class.

The cargo space will accommodate 5000 tons of dry cargo and 850 tons refrigerated cargo in six chambers. Special compartments have been arranged for mail, express and a specie room for bullion. Fuel oil tanks have a capacity of 40,000 barrels. Fresh water tanks will accommodate 2800 tons.

The vessels will be propelled by twin screws, and the main propelling machinery will consist of three turbines and a set of single reduction gears on each shaft. The normal shaft horsepower is 22,000 with a maximum of 25,000. Steam will be supplied by 12 watertube boilers. All of the auxiliary machinery will be electrically operated, the current supplied by four 500 kilowatt generating sets.

First class public spaces have been arranged on A deck, with a library, writing room, lounge, theater, smoking room with men's club and card room adjacent. On this deck also will be an exceptionally large ballroom veranda extending the width of the ship and entirely closed in with adjustable low type glass windows. On the dome over the social hall there is a new feature in a game deck which provides a tennis court, hand ball court and space for other sports.

Each ship will have two outdoor swimming pools, built into the vessel, a delightful innovation for travel in the tropics. Convenient to the swim-

ming pools will be dressing rooms, gymnasiums and electric cabinet baths.

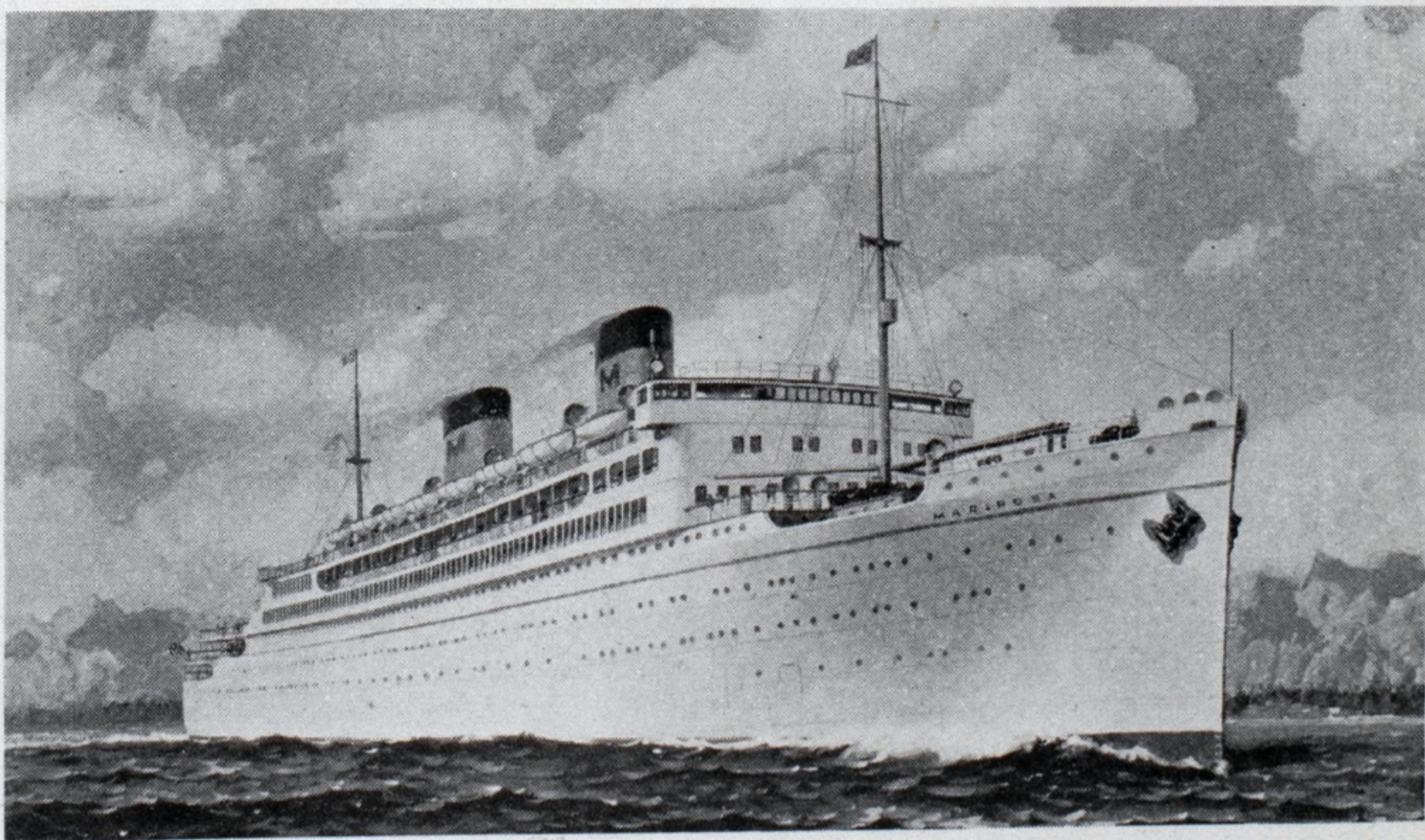
One large galley is provided between two spacious dining salons which will accommodate practically the ship's entire passenger complement at one time. The modern galley will have the latest in scientific culinary equipment with electric ranges, electric grill and electric bakery.

Ventilation for the entire ship will be the Thermotank system, arranged for circulation of either natural or heated air. Forced ventilation will change the air in enclosed spaces every 3 to 5 minutes. The sides of the vessel will be protected against outside heat by cork insulation.

Staterooms are unusually large, and with the exception of a few maids' rooms at the center of the ship, all are arranged as outside staterooms. Every first class room on the ship has either a private bath, private shower, or connecting bath. Each bath has hot and cold fresh water. All staterooms will be fitted with extra large twin beds, and furnishings to match will be on a par with the finest hotel or club.

There are numerous deluxe staterooms with large private verandas. Two special deluxe stateroom suites on C deck consist of two double bedrooms, living room, maid's room, dressing room and trunk room, specially equipped and decorated.

A complete telephone system will be installed throughout the ship, each room, cabin and first class, being provided with a private 'phone. On each liner there will be a complete newspaper plant, printing last minute news and stock reports, a theatre in which the latest talkie releases will be shown, and a complete broadcasting system bringing into private staterooms available shore programs and such ship programs as are put on in the various public rooms. Smart shops, beauty salons, etc., add to the features of the ships.



Artist's conception of new Matson liner Mariposa to be launched July 18 at Fore River plant of Bethlehem Shipbuilding Corp.

S.S. President Hoover Exceeds Guarantee on Sea Trials

WITH a top speed of 22.2 knots and an average of 21.558 knots for the five high runs during standardization trials off Rockland, Me., June 18, the S. S. PRESIDENT HOOVER exceeded her guarantee by over one knot. This ship, with twin screw turbine electric drive, is the largest and highest powered merchant vessel thus far built in the United States. The sea trials, including complete standardization runs, are the most extensive ever held for a merchant ship and the results in every respect were highly satisfactory to the owner, the Dollar Steamship lines, and the builder, the Newport News Shipbuilding & Dry Dock Co.

With a total of five hundred in crew, observers, and guests, the S. S. PRESIDENT HOOVER sailed from Newport News, Va., at five a. m., June 16, arriving Rockland, Me., Wednesday evening, June 17. The standardization runs were held over the measured nautical mile on Thursday, June 18. Twenty runs were made, five of which were at high speed. The average of the top speeds was 21.558 knots at 141.48 revolutions per minute and 31,050 shaft horsepower with the vessel ballasted to 26 feet mean draft at a displacement of 24,400 tons. The highest speed was 22.2 knots at 143.36 revolutions per minute and 32,823 shaft horsepower. She made her guaranteed speed of 20.5 knots with something over 3000 horsepower to spare.

On the return from Rockland, an eight hour trial at sea was held at an average speed of 20.86 knots at 26,495 shaft horsepower with a fuel consumption of 0.676-pound of oil per horsepower per hour for all purposes. The standard method of the United States navy was used in determining the fuel consumption. After the eight-hour trials at sea with one generator in use, the vessel operated at a cruising speed of 16.5 knots plus, developing 11,000 to 11,800 shaft horsepower at 101 to 104 revolutions per minute. Full speed ahead, reverse to stop and full speed astern, a figure eight at full speed with helm hard over, were some of the maneuvers carried out. Both bow anchors were let out to 75 fathoms.

The vessel arrived off the Capes at midnight on Friday, June 19, and docked at the shipyard at 8:00 a. m., June 20, after what was generally conceded by all on board to have been one of the most thorough and satisfactory sea trials of a merchant ship thus far held in the United States.

Among the guests and observers on board were J. Harold Dollar, Mrs. Dollar, and Mrs. Keith Ferguson; W. L. R. Emmet, Eskil Berg, and Charles Scott

of the General Electric Co., builders of the machinery; Captain Roger Williams, vice president, in charge of the trial; J. B. Woodward, assistant general manager; C. F. Bailey, engineering director; J. F. Nichols, chief engineer, and H. F. Norton, naval architect of the Newport News Shipbuilding & Dry Dock Co.; J. H. King of Babcock & Wilcox Co.; S. W. Wakeman, vice president; H. R. Gould, general manager; Hugo P. Frear, consulting naval architect, and John Burkhardt, chief engineer, of the Bethlehem Shipbuilding Corp.

The American Bureau was represented by Capt. C. A. McAllister, president, and David Arnott, chief surveyor. Vice president and commissioner, E. C. Plummer represented the United States shipping board, Capt. L. Westdahl, marine superintendent, and J. Bullock, superintending engineer, who represented the owner in the building of the ship, were also on board, as were Capt. F. E. Anderson and Chief Engineer Frank Littlefield, who are to take over the new ship when she goes into commission. Capt. A. T. Wright (CC) U. S. N., superintending constructor at the yard, and Capt. O. L. Cox, U. S. N., bureau of engineering, represented the navy.

The trials were conducted by the shipyard, and Capt. Jos. I. Kemp was in command. N. Christiansen, superintendent of machinery at the yard, was in charge of machinery.

The ship will be delivered about July 11, and will sail on her maiden voyage from New York to Manila, via the Panama canal, Los Angeles and San Francisco, on Aug. 6.

The PRESIDENT HOOVER was launched on Dec. 9, 1930, recorded in an article in the January issue of MARINE REVIEW. A complete article and a full report of the trial will be published in the August issue.

New Liner Makes Record

The Canadian Pacific liner EMPRESS OF BRITAIN docked in Quebec, June 22 from Southampton and Cherbourg with a list of distinguished passengers who had just made the fastest crossing of the Atlantic ever recorded by a passenger vessel. She tied up at her dock in Quebec in a total elapsed sailing time of 4 days 12 hours 30 minutes. She averaged 26.22 knots.

Capt. R. G. Latta, asked by reporters what he had to say about his fast crossing, remarked, "There is no need for me to say anything, the EMPRESS has said it for herself."

Chief Engineer Harry Donald was

equally modest. "We have just been treating good machinery with respect," he said. "We are running the engines in easily, and still have a few thousand horsepower in hand."

On her maiden voyage from Southampton to Quebec where the EMPRESS OF BRITAIN arrived June 1, she made the crossing in five days, five hours and 42 minutes, an average speed of 22.63 knots.

Sale of American Diamond Line Is Authorized

Acceptance of an offer to purchase the American Diamond lines received from the Black Diamond Steamship Corp., New York, present managing operators of the line, at the rate of \$16.25 a deadweight ton was authorized by the shipping board on June 3 under certain terms to guarantee performance of conditions set forth in a certified ocean mail contract covering the route. The total price to be received for the line is \$1,660,181.25, which is to be payable 25 per cent in cash and the balance over a period of seven and one-half years, with interest at the rate of 4¼ per cent payable semiannually.

The American Diamond lines comprise freight services between North Atlantic ports of the United States and the Continental European ports of Rotterdam and Antwerp. There are 12 typical cargo vessels aggregating 102,165 deadweight tons. Under the contract of sale the owner will be required to make not less than 72 round voyages a year of which 24 will be semi-monthly sailings from New York to Rotterdam, 24 will be semi-monthly sailing from New York to Antwerp, and the balance will be semi-monthly sailings from north Atlantic ports of the United States other than New York to the foreign ports named.

The price agreed to for the line is predicated upon the performance by the purchaser of considerable improvements to the character of the vessels maintained by the line. These improvements are stipulated in the certified ocean mail contract covering the service and will consist primarily in the construction of five 16-knot passenger-cargo steamers during a 10-year period, and the reconstruction of five of the existing vessels to give them a speed of 13 knots. This would involve an outlay of many millions of dollars before the building program would be completed. The sales contract with the shipping board, however, will specify the price for the line will be at the rate of \$28.65 a ton in the event that the improvements are not made.

American shipping passing through the Suez canal in 1930 decreased in all categories, as compared with the preceding year.

Recent Developments in the Lighthouse Service

LIGHTING and otherwise marking the coastal and inland waters of United States, so that they may be available for the safe navigation of vessels, is one of the the oldest activities of the federal government, in fact antedating the formation of the union in several important instances. Protection to the lives and cargoes entrusted to vessels was demanded almost as soon as the colonies had a merchant marine worthy of the name.

Quite early in the history of the lighthouse service, lightships were introduced, the screw pile lighthouse was tried out, caisson foundations were developed, and skeleton steel construction made its appearance.

With each lighthouse forming a protected area equal to the range of its light and its fog signal, there came a time when a journey along the entire coast could be made without being for long out of sight of at least one light. When this stage had been reached it might be said that the "guiding" function of lighthouses had become of equal importance with the "warning" function.

The development of buoys, and the more recent increases in their sizes, with a consequent greater ability to remain on station under adverse conditions, has made possible an expansion of the guiding function. The buoyage system has developed into a means of marking safe lines from the open sea through the intricacies of harbor channels to the dock sides. Large sea type buoys now also serve as links in the chain of offshore lightships.

Much progress has been made in the redesigning of buoys of all types. Hulls have been strengthened and made more seaworthy; moorings and mooring attachments now permit establishment of buoys in deep water, and minimize the possibility of buoys being dragged from station or breaking adrift.

Another outstanding feature of recent lighthouse work is the substantial yearly increase in the number of automatic or unattended lights, aids of this type making possible a considerable increase in service at comparatively small expense. The unattended light depends for its effectiveness upon the perfection of automatic apparatus capable of burning for long periods of time without attention, of producing suitable light characteristics, and of replacing burned out bulbs where electricity is used. Multiple burners, flashers and other items needed in the operation of unattended lights have now been developed to a high degree of reliability.

The use of electricity, while not new in the lighthouse service, has increased considerably in the last few years. In many cases this has been connected with the installation of radiobeacons, these signals requiring a current source easily augmented to serve other purposes as well. Electricity has made it possible to increase the candlepower of many lights without other changes.

Fog signal equipment, other than radiobeacons, has also shown new tendencies. While the earlier installations of power signals depended usually upon the use of steam, this power source is gradually being replaced by air and electricity. In both of the new types, internal combustion engines are utilized, a decided improvement in efficiency over steam, as they are quickly started should fog appear suddenly.

Lightship development has consisted of three parts closely interwoven. These are, improvements in hulls, new propelling machinery, and new signaling devices. Certain changes have been made in the latest hulls to secure desirable qualities of seaworthiness, and because of the requirements of the new types of machinery. The interior arrangements have tended to supply greater comforts for officers and crew. Improvements in signaling devices are comparable to those made at shore stations, and are at the same time closely connected with recent choices in motive power.

Masthead lights of nearly all first class lightships are now electric incandescent. On the older vessels current is produced by steam or internal combustion auxiliaries, which also serve in certain instances for the pro-

duction of current for the radiobeacon. Steam fog signals, the normal equipment aboard the earlier steam propelled lightships are giving way to compressed air or electrically operated signals where diesel power is available.

The propelling equipment of lightships, important not only to their efficiency and ability to remain on station, but directly related to the types of signalling apparatus on board, has changed considerably in recent years. From the earliest lightships, with no motive power other than sails, through the various types of steam propelled vessels, the lighthouse service has now turned to diesel engines. The choice rested very largely upon the adaptability of diesel electric equipment to auxiliary purposes as well as for vessel propulsion. Diesel electric generating sets on the newer lightships are used interchangeably for propulsion and for operating signaling equipment installed on the vessels.

Modern engineering practices have made possible the economical erection of lighthouses at difficult points, and brought about a tendency to relocate those aids not situated at the most strategic points. A noteworthy example of such a change is the construction this year of a new lighthouse at Detour, Mich., on Lake Huron. The original station was erected on shore, more than a mile from the edge of the deep water channel, while the new station stands in deep water where vessels may lay their course to pass close to it.

The most important single development in lighthouse work within recent years has been the adoption of radio as a signaling medium. The radiobeacon has made it possible for the great landfall stations to maintain their efficiency even in the densest fog. Radiobeacon signals are capable of interception up to distances of 200 miles, and are thus valuable also for long range clear weather bearings.

The radiobeacon has passed rapidly through a number of stages since its adoption ten years ago. Operating periods have been increased until nearly all stations operate for a portion of every hour in clear weather as well as continually during fog. Stations have been grouped and synchronized so that their signals are heard in rotation, a great aid in avoiding interference. The range of radiobeacons has been restricted to short radiuses where a beacon is of only local value, this also lessening interference.

Still in the experimental stages is the linking of radiobeacon signals with sound fog signals as a means of determining distance. The use of electric lights on buoys has been tried out experimentally. A positive acting fog signal, not dependent upon wave action, for installation upon buoys, and to be controlled from a remote point, is also a possibility of the future. The more assured advances are, however, in the line of greater efficiency and service at decreasing costs.



Poe Reef light station, Straits of Mackinac

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

THE rule is that a vessel "sails" from the port when she has her cargo on board which she intends to carry, is in complete readiness for the voyage with stores and crew aboard.—Archibald McNeil & Sons Co., Inc., of New York, v. Western Maryland Railway Co., 42 F. (2d) 669.

* * *

IT IS well settled that a vessel which is maneuvering to enter an anchorage ground or is maneuvering out from an anchorage ground is not on a definite course or a fixed speed, and she is therefore not a privileged vessel. The very foundation of the crossing rule is that the burdened vessel, by observing the continuous course and fixed speed of the privileged vessel, knows absolutely where she will be and how she will be heading at any future moment.—ARFELD, 42 F. (2d) 745.

* * *

STEVEDORES have a maritime lien upon the freights, enforceable in admiralty. The mere fact that the shipper entered into a contract with the receiver for the owners of the ship, compromising various claims and indebtedness, or agreed to a reduction of the carrying charge, does not change or modify the lien of the longshoreman; and that lien is assertable in a court of admiralty, and follows the freight, and attaches to the proceeds and revenue that can be distinctly traced, and adheres to the proceeds in whose hands soever they may come.—SURICO, 42 F. (2d) 935.

* * *

SUBSEQUENT knowledge of how one might have avoided a disaster should not be taken as an unqualified test of whether there was a prior duty to avoid it. "Where, as here," declared the court in the case of AMBRIDGE, 42 F. (2d) 971, "the fault of one vessel is clearly established, the evidence of the other vessel's fault must also be clear and convincing in order to make out a case for apportionment of damages."

* * *

WHERE a tug has brought her barge to the place designated and moored her safely, the tug's task is completed.—New Jersey Shipbuilding & Dredging Co. v. Tracy Towing Line, 42 F. (2d) 1005.

* * *

INDEPENDENT of statute, the fact that salvor and salvaged vessels belonged to the same owner does not preclude the owner of the salvaging vessel from recovering salvage against the cargo of the salvaged vessel, provided the peril which rendered the service

necessary did not arise through any breach of the contract of carriage. And now it is provided by statute (Act Aug. 1, 1912, sec. 1), that the right to remuneration for assistance or salvage services shall not be affected by common ownership of the vessels rendering and receiving such assistance or salvage services.—Southern Pacific Steamship Co. v. New Orleans Coal & Bisso Towboat Co., 43 F. (2d) 177.

* * *

THE words, "shipped in apparent good order and condition," "to be delivered in like apparent good order and condition," in bill of lading, import an admission that the goods when shipped were, so far as could be seen, in good order, and the goods so far as visible were not damaged. More than this the owners did not represent. The onus upon the ship owner is met by proof either that the damage did not arise during shipment, or that it was within the exceptions of the bill of lading.—VALLESCURA, 43 F. (2d) 247.

* * *

THE grounding of a vessel during a heavy fog was said, in the case of Kelly, Weber & Co. v. Franklin Fire Insurance Co., 43 F. (2d) 361, to constitute "peril of the sea" within a policy of marine insurance covering damage to cargo.

* * *

IT IS well settled in admiralty law that when a tug grounds her tow on a well-known and charted shoal there is a presumption that the accident was due to the negligence of the tug. Tugboats and their masters who assume the duty of towing must know tides and currents and make proper allowance for them.—Coastwise Transportation Corp. v. United States, 43 F. (2d) 401.

* * *

BY ARTICLE VI of the rules of Olerun, a sailor injured by his own wilful misconduct could not be cured at the expense of the ship, and might be discharged. Under the laws of Wisbuy, if injured on shore in the master's or ship's service, he was entitled to maintenance and cure, and, no doubt, if injured while off duty aboard ship, the same rule applies. Under the modern French commercial code (article 262), and in the United States, a seaman is entitled to wages and medical treatment, if sick, during the voyage, or injured in the ship's service. And the cure would extend a reasonable time beyond the voyage. For wilful misconduct a seaman is not entitled to maintenance and cure, and, if the wilful misconduct was not sufficient to warrant discharge, the ex-

pense could be deducted from the earned wage during the voyage, and, if rightfully discharged, claim to wages for the voyage terminated, and, if not so discharged, deduction for wages during disability.—Meyer v. Dollar Steamship line, 43 F. (2d) 425.

* * *

THE fact that a vessel is in charge of an unlicensed man raises a natural doubt as to the skill with which she was managed and is evidence of negligence, but it is not of itself negligence. Violation of law does not make her an outlaw or a trespasser.—Richards v. City of Boston, 43 F. (2d) 448.

* * *

IN THE case of Meyer v. Dollar Steamship line, 43 F. (2d) 4255, the court said: "'Seaman,' no doubt, once meant a person who could hand, reef, and steer, a mariner in the full sense of the word. Changed conditions and necessities gave 'seaman' an enlarged meaning. The cook and the surgeon, porters, chambermaids, and employees, other than able seamen, have been included. The term 'seaman,' however, has never been extended to include prize fighters, wrestlers, etc., but, no doubt, if employed as such to carry out some purpose of the ship, would be included. * * * While sailors are wards of admiralty and are rather excused than condemned for accidental mistakes while in the faithful and obedient discharge of duty, the court, however, does judicially know that intelligence, status, and condition of seamen has progressed with the improved methods of navigation, and the reasons for such guardianship have been lessened, that a voyage now is made within two or three months that, within several generations, ordinarily required two or three years, and that the term 'drunken sailor' has become obsolete in the American marine. It may not be said that a seaman who engages in prize fight encounter, or wrestling, or in any test of physical strength or agility, is engaged in discharge of any obligation in the shipping articles. The resultant test of physical strength was a personal matter, pleasure, or privilege while off watch and not in the discharge of any obligation under the articles."

* * *

A SEAMAN may recover damages for an assault committed by a subordinate officer who acts within the general scope and line of his employment. In the instant case it appeared that injuries to a seaman were permanent in character, his nose being fractured and his breathing obstructed, and the court held that he should be awarded the sum of \$400.—Bonsalem v. Byron Steamship Co., 43 F. (2d) 443.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	478	2,434,601	511	2,542,351
April	496	2,538,201	527	2,656,992
March	494	2,396,654	489	2,323,422
February	439	2,127,771	484	2,261,468
January	486	2,417,338	542	2,533,711
December	539	2,497,454	521	2,454,917
November	485	2,194,780	470	2,144,883
October	530	2,546,629	548	2,636,414
September	591	2,877,309	556	2,693,493
August, 1930.....	554	2,716,668	586	2,855,323

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931	82	235,108	62	170,497
April	68	189,113	51	136,433
March	65	198,848	46	116,786
February	69	200,212	53	163,134
January	70	227,146	49	158,570
December	80	206,778	55	144,471
November	87	226,006	46	122,107
October	85	231,460	53	144,530
September	87	232,781	52	147,365
August, 1930	92	244,206	55	144,201

Boston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	108	311,171	91	293,146
April	107	292,403	89	233,756
March	97	279,797	66	243,377
February	76	259,402	57	190,598
January	76	245,382	49	195,091
December	91	287,347	50	174,971
November	77	248,220	61	232,826
October	96	321,092	65	208,695
August, 1930	115	305,649	101	299,454

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931	11	30,000	10	25,765
April	6	20,081	7	20,122
March	18	48,722	15	45,664
February	14	40,247	15	46,602
January	23	55,605	23	60,126
December	21	46,182	20	40,916
November	17	41,667	20	45,989
October	32	53,423	28	49,428
September	36	69,765	36	72,282

Providence

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931	9	37,120	2	8,674
April	8	32,848	6	25,101
March	5	18,288	4	17,400
February	9	43,707	8	30,036
January	8	28,019	5	15,335
December	9	36,380	6	25,318
November	13	46,927	5	18,597
October	10	37,269	5	22,305
September	6	28,972	3	16,265
August, 1930	7	29,532	4	16,388

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	24	94,695	39	142,847
April	26	104,099	36	141,036
March	41	158,869	46	173,220
February	24	95,726	43	175,697
January	29	119,686	47	192,455
December	27	107,300	52	197,628
November	30	122,020	53	208,266
October	40	155,991	54	207,118
September	30	122,022	46	182,641
August, 1930	32	125,137	46	174,985

Baltimore

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	110	353,301	118	368,874
April	131	409,907	139	420,594
March	123	385,514	107	336,157
February	99	327,516	106	340,771
January	121	386,924	127	412,306
December	120	390,126	127	429,048
November	116	384,877	117	376,725
October	139	452,905	127	402,155
September	150	475,928	138	424,976
August, 1930	130	412,209	125	396,421

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	22	63,739	49	140,356
April	14	31,959	40	116,565
March	19	47,982	52	137,616
February	15	43,123	46	116,116
January	21	57,883	61	170,594
December	44	92,341	63	174,384
November	22	65,716	56	141,242
October	21	72,517	58	153,410
September	21	48,971	66	168,922
August, 1930	28	66,765	50	139,710

Jacksonville

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931.....	8	21,046	7	11,045
April	15	31,901	5	10,614
March	10	17,299	6	7,839
February	7	18,934	9	20,915
January	14	28,243	10	15,617
December	17	33,862	16	29,847
November	14	30,105	10	13,048
October	14	27,810	14	27,016
September	12	26,442	13	26,356
August, 1930	15	29,565	12	20,856

Key West

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931	83	91,683	80	90,758
April	60	55,493	51	54,656
March	60	69,731	56	72,956
February	61	70,169	56	69,443
January	61	82,218	57	30,394
December	56	71,327	56	75,588
November	49	63,307	50	64,389
October	50	61,288	49	60,432
September	48	64,968	48	64,742
August, 1930	50	61,440	50	61,666

Mobile

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931	103	194,198	93	194,198
April	107	251,402	108	242,685
March	109	232,778	102	229,966
February	93	222,163	86	206,376
January	112	282,874	111	249,375
December	91	208,802	84	194,477
November	106	241,663	99	220,755
October	99	187,035	92	196,893
September	83	184,276	81	171,679
August, 1930	102	190,362	96	176,488

Seattle

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
May, 1931	43	185,945	43	184,118
April	50	214,534	48	210,117
March	47	207,105	49	212,237
February	48	212,187	53	233,121
January	54	238,037	60	266,744
December	56	240,203	61	256,724
November	59	255,728	57	245,592
October	57	246,957	63	272,114
September	62	268,203	58	250,301
August, 1930	48	200,602	48	209,109

New Orleans

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	185	532,046	192	551,459
April	195	576,251	181	536,678
March	185	545,474	188	537,148
February	159	499,643	172	537,813
January	207	610,472	190	548,267
December	203	602,527	197	578,723
November	187	555,053	194	541,671
October	218	633,652	228	672,782
September	210	589,459	218	605,239
August, 1930	220	600,786	241	666,625

Charleston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net. tonnage	No. ships	Net tonnage
May, 1931	17	45,890	19	50,033
April	15	36,938	12	27,110
March	14	33,837	16	37,092
February	20	47,834	21	49,516
December	22	62,668	23	66,852
November	23	63,701	24	65,492
October	19	47,530	27	74,815
September	19	54,863	19	69,530
August, 1930	13	34,274	13	24,742

Galveston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	27	53,091	69	191,632
April	26	62,924	68	210,315
March	25	39,536	69	205,341
February	23	40,825	71	209,057
January	25	45,442	84	260,555
December	40	97,907	91	282,726
November	27	58,099	101	303,748
October	25	47,967	111	339,152
September	46	117,185	119	337,091
August, 1930	37	82,429	97	277,077

Los Angeles

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	210	696,717	194	731,392
April	225	644,178	209	626,590
March	224	602,763	210	623,023
February	181	557,981	196	561,570
January	191	673,620	193	753,720
December	227	654,598	184	596,347
November	219	618,855	206	616,266
October	236	680,430	217	628,733
September	255	697,262	218	616,018
August, 1930	211	631,167	221	621,088

San Francisco

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No.	Net	No.	Net
	ships	tonnage	ships	tonnage
May, 1931	161	658,525	163	676,789
April	568	1,473,401	588	1,547,440
March	622	1,558,225	609	1,432,869
February	532	1,405,034	563	1,386,464
January	165	685,851	172	721,042
December	154	646,767	174	689,358
November	144	570,715	161	656,424
October	151	617,143	154	639,552
September	171	699,832	154	629,577
August, 1930	164	670,748	159	653,208

John F. Fowler, Export Trade Authority, Dies

JOHN F. FOWLER, 70, former vice president of W. R. Grace & Co., New York, died at his home in Rye, N. Y., of a cerebral hemorrhage after an illness of three months.

Mr. Fowler entered the employ of W. R. Grace & Co. in 1875 receiving his early training under the direction of W. R. Grace, the founder. This was in the days when travel by sailing ships around the Horn was the chief means of communication with the west coast of South America. After having been manager of the general export and import business in the home office in New York, Mr. Fowler became joint manager for the company in Valparaiso, Chile, where he was sent in 1893. Later he was senior manager of the company's entire Chilean business. He helped to establish the Merchants line to the west coast of South America, which first operated through the Straits of Magellan and which afterward became the Grace line.

In 1908 he returned from Chile to become a vice-president of the company in New York, in which capacity he served until his retirement several years ago. He was an accepted authority on export merchandising.

Mr. Fowler was a member of the chamber of commerce of the State of New York, the Merchants' association, the American Arbitration association, Union Interalliee, India House, Greenwich Country Club, American Yacht Club and the Friendly Sons of St. Patrick.

He is survived by his wife, Mrs. Marie Keppler Fowler; a daughter, Miss Mary Fowler, and a son, John F. Fowler Jr.



John F. Fowler

Prominent Naval Architect And Marine Engineer Dies

MARTIN C. FURSTENAU, one of the best known marine architects and engineers in this country, died at his home in Philadelphia on June 3.

Born in Detroit, on Sept. 30, 1869, he attended the Detroit public school and graduated from the high school. He began work in the foundry of the Fontier Iron Works in that city, becoming foreman patternmaker and finally working in the drawing room. Subsequently he served at the Detroit Dry Dock Co. under the late

Frank E. Kirby, where he acquired an extensive knowledge of hull design, and later worked under George Mattsson in the engine and boiler department until 1900 when he took charge of the shipyard department of the Petersburg Iron Works, Petersburg, Va. From 1902 to 1906 he was affiliated with the United States engineer department, being responsible for the design and construction of many dredges during that period. In 1906 he became associated with Rear Admiral George Melville and John H. MacAlpine in the design of the Philadelphia city ice breaker JOHN WEAVER, one of the few vessels of her class and design in the world. After completion of the WEAVER he went into business for himself as consulting marine engineer and naval architect, serving many prominent steamship lines in that capacity.

Engineer Promoted

John Johnson, naval architect gold medalist and England's leading authority on steam propulsion, was appointed chief engineer of steamship services of the Canadian Pacific, effective June 1. Mr. Johnson's new duties will be in connection with the design and construction of tonnage for the Canadian Pacific steamships. He was formerly chief superintendent engineer of the line.

Appointed Vice-President McIntosh & Seymour Corp.

AT A RECENT meeting of the board of directors of the McIntosh & Seymour Corp., John Thomas was appointed vice president



John Thomas

in charge of sales. Mr. Thomas is a native of Alabama, a graduate engineer and was for 10 years with the General Electric Co., during the latter part of which period he was in charge of the marine section. He became general sales manager of McIntosh & Seymour Corp., Oct., 1930.

J. C. McQuiston, general advertising manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., retired from active service on June 1. He had been in charge of advertising for the Westinghouse company for 29 years.

McIntosh & Seymour Corp. has closed its Jacksonville, Fla. office, having moved it to 910 Seventeenth street, N. W., Washington.

Joins Staff of Surveyors of Salvage Association

ROBERT P. GILRAY, who recently joined the staff of the United States Salvage association in the capacity of surveyor, will be stationed at Cleveland. Prior to having joined the association he was associated with the Hartford Co. of Hartford, Conn., for approximately 14 years in survey and inspection work. In addition Mr. Gilray has had about 14 years' experience



Robert P. Gilray

on the Great Lakes, having served in the employ of the Great Lakes Dredge & Dock Co. and the Duluth - Superior Dredge Co. at various Great Lakes ports and with the Great Lakes Towing & Wrecking Co. at Sault Ste. Marie, Mich.

He also served six years in the engine departments of various vessels owned by the Pittsburgh Steamship Co. and the Algoma Central Steamship Co. and on machinery installation at the South Chicago yard of the American Ship Building Co.

Mr. Gilray is a native of Sault Ste. Marie, Mich.

D. J. Quammen has been appointed manager of the Philadelphia district office of Cutler-Hammer, Inc., to succeed F. J. Burd, who has been made assistant manager of the Chicago office.

George B. Karelitz has been appointed acting manager of the mechanics division of the Westinghouse research laboratories, to fill the vacancy caused by the recent promotion of John M. Lessells to the South Philadelphia works of the company.

The Marine Steel Corp. has moved its New York city offices from the Chrysler building, 405 Lexington avenue, to 11 Broadway.

Baltimore Mail Appoints Superintendent Engineer

Joseph Cook, veteran marine engineer, has been appointed superintendent engineer of the Baltimore Mail Steamship Co. with headquarters in Baltimore. He is now at the yards of the Federal Shipbuilding & Drydock Co. at Kearny, N. J., supervising the installation of all machinery on the five new vessels of the line, the first of which is expected to make her maiden voyage from Baltimore to Hamburg on July 2. He will make the first trip on this ship.

Discussing the Question of Load Line Legislation

By Norman F. Titus

THE shipping business is constantly undergoing development, just the same as practically every other line of human endeavor. The increase in size and speed of ships, with the growing importance of liner service, are introducing new problems and emphasizing old ones.

The operation of ships brings into play three principles: First, the endeavor of the owner to obtain a profit; second, the shipper to secure adequate service with proper care and custody of goods entrusted to the owner, and, third, the insistence of the public upon safety of life and property at sea. The complete achievement of these three purposes can only be accomplished through the aid of government.

Government regulation is a beneficial function if applied with wisdom. No one now denies the great benefits to the public and the railroads themselves obtained through the regulation made possible by the Interstate Commerce act. Furthermore, the regulation of national banks is an acknowledged necessity.

Shipping already has many forms of regulation, some of it introduced to correct former abuses. Our navigation laws abound with provisions due to conditions present in sailing-ship days. For instance, there is a table specifying the quantity of all kinds of food to be supplied on the different days of the week and there is also in effect the mandate to have weights and measures available to determine the quantity of food supplied.

Another series of regulations is found in the operation of the steamboat inspection law. Under this law every United States vessel must have a certificate giving full particulars concerning the ship, the conditions of operation and the complement of crew. Furthermore, the vessel is inspected as to hull, machinery and all appurtenances at least once a year. The officers of the ship function under license of the inspection service. Many other rules abound for operation of the ships.

Again, now as traffic rules are necessary for highway traffic, so are

An address delivered by Mr. Titus, general manager of the New York-New Jersey Business Associates, Inc., before the Propeller club of San Francisco and the San Francisco chamber of commerce.

rules provided for sea traffic. In 1890 the President of the United States called an international conference in Washington which drew up the present rules of the road at sea. Herein is provided the system of whistles and lights now in vogue, internationally, together with other rules concerning, for instance, operating in a fog.

It is apparent from these few instances that regulation of shipping is carried on very extensively. It is strange that legislation concerning loading of vessels has only just been enacted in the United States.

As early as 1875 Samuel Plimsoll agitated in the British parliament and forced the passage of legislation requiring vessels entering or leaving British ports to have a fixed mark designating maximum loading. The British board of trade was given very broad powers in enforcing the provisions. After the enactment of the first British law in 1875, practically all other important maritime nations soon passed load line legislation. During all this period vessels of the United States have been plying in and out of foreign ports under sufferance, as they had no load line marks as none was required by this country.

Under date of March 2, 1929, a load line law was passed, becoming effective Sept. 2, 1930, which established load lines for United States vessels of 250 gross tons and over, engaged in the foreign trade. The secretary of commerce was designated to promulgate the necessary regulations to make the law effective.

In February, 1928, Herbert Hoover, then secretary of commerce, anticipated the impending legislation and decided to call upon the marine industry to recommend to the secretary of commerce the necessary regulations. To this end he appointed the United States load line committee consisting of representatives from the following interests: Atlantic coast shipowners, Pacific coast shipowners, American Bureau of Shipping, shipbuilders, marine underwriters, shipping board, tanker owners, department of commerce and the bureau of navigation. The principle involved in the appointment of this committee was purely one of self-government and is one outstanding example of the co-operation of industry with government.

The load line committee investi-

gated the subject for two years and recommended rules to the secretary of commerce which were subsequently adopted and promulgated Sept. 2, 1930, for vessels in the foreign trade. These regulations were accompanied by complete maps specifying, also, weather zones affecting shiploading.

In the summer of 1930 the representatives of 30 countries met in formal conference in London and, on July 5, signed a convention on load lines. This convention was ratified by our senate Feb. 27, 1931. This represents the first attempt ever made to regulate the loading of vessels by international agreement. In a general way it may be stated that the convention applies to all ships belonging to countries which ratify the convention, when such ships are engaged on international voyages. It is felt that the convention will result in better designs of ships and in vessels being better suited for their trades. These vessels will embody greater safety with no economic disadvantage.

At the present time a bill establishing load lines in the coastwise trade is before congress and possibly will pass at the next session. In anticipation of this impending legislation the load line committee is studying the situation very carefully, preparatory to making recommendations to the secretary of commerce.

Retiring Director Honored At Testimonial Dinner

Julius P. Meyer, upon the occasion of his retirement from the Hamburg-American line after 42 years of service, was tendered a testimonial dinner by 110 international shipping men in New York on June 3.

Mr. Meyer's first connection with the Hamburg-American line dates back to 1888 when he entered the employ of Kunhardt & Co. who were general agents for the line and of which firm his father was a member for many years.

He entered the service of the Hamburg-American line in January, 1889 when the company opened its own office in New York. After various promotions he became assistant to the general manager, and in 1912 was appointed vice director. After the war, the Hamburg-American line resumed operation in 1920, under agreement for a joint service with the United American lines.

In 1926, the Hamburg-American line took over the ships and the entire operating organization of the United American lines, (Harriman group of shipping interests) at which time Mr. Meyer was appointed, together with Emil Lederer and C. J. Beck, a member of the executive board of directors in New York.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

ON MAY 1, 1931 American shipyards were building or under contract to build for private owners 183 vessels aggregating 396,886 gross tons compared with 173 vessels aggregating 408,851 gross tons on April 1.

The Bethlehem Shipbuilding Corp. had under construction three passenger and cargo vessels totaling 52,500 gross tons for the Oceanic Steamship Co.; three passenger and cargo vessels totaling 21,600 gross tons for the United States Mail Steamship Co.; and one tanker of 1534 gross tons for the Standard Transportation Co. The Federal Shipbuilding Co. had under construction four passenger and cargo vessels totaling 44,000 gross tons for the Grace line. The Newport News Shipbuilding & Dry Dock Co. was building two passenger and cargo vessels, totaling 43,800 gross tons for the Dollar Steamship line; three passenger and cargo vessels totaling 22,500 gross tons for the United Mail Steamship Co.; and also two passenger and cargo vessels totaling 11,400 gross tons for the Eastern Steamship lines. The New York Shipbuilding Co. was building one passenger and cargo vessel of 8041 gross tons for the Export Steamship Corp. and two passenger and cargo vessels totaling 60,000 gross tons for the United Line, Inc. Four tankers and one passenger and cargo vessel, totaling 44,272 gross tons were under construction at the Sun Shipbuilding & Dry Dock Co. The four tankers of 9000 gross tons each were building for the Motor Tankship Corp. and the passenger and cargo vessel of 8272 gross tons was being built for the American South African line.

Plan New Vessels

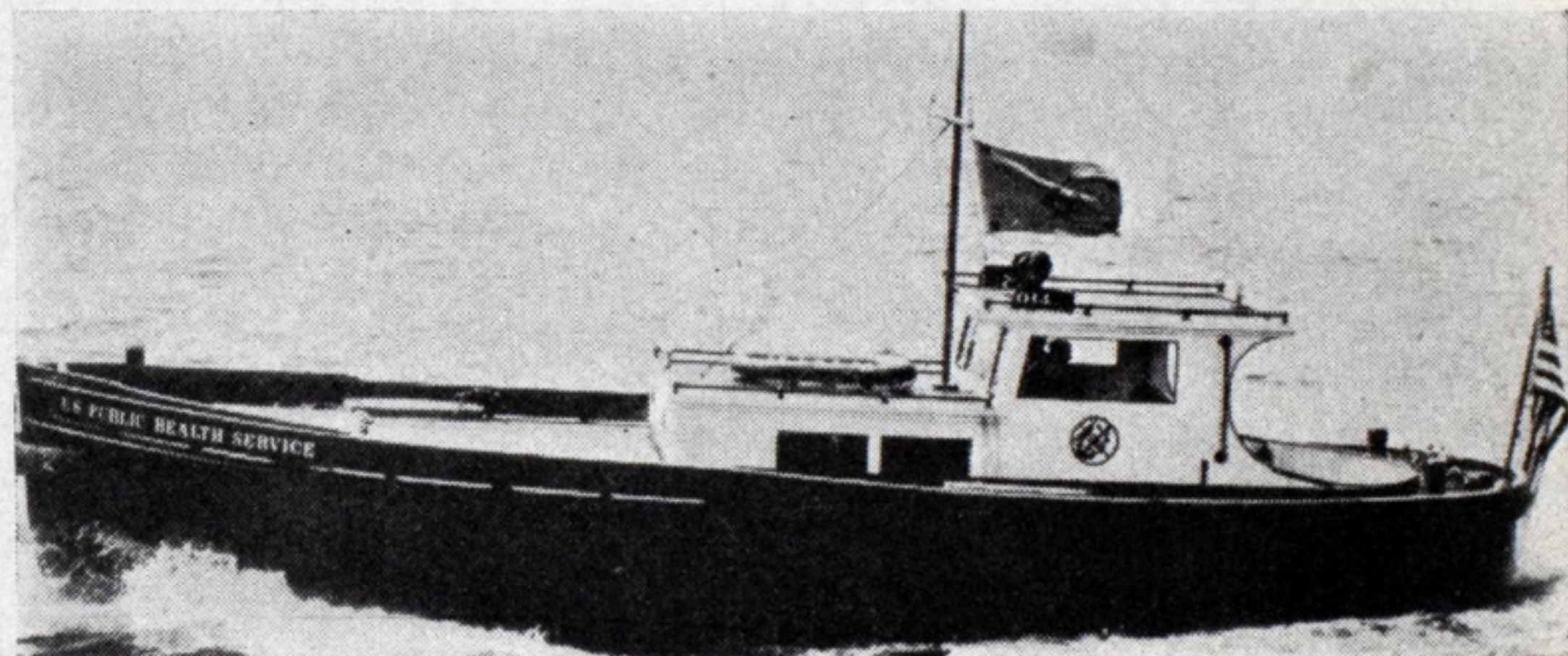
Plans are being considered by the Black Diamond Steamship Corp. which operates the American Diamond line for the construction of \$10,000,000

worth of new ships for the North Atlantic trade. No agreement has been reached regarding the design of the new ships, but several possible types are being tested by models in the Washington navy yard. The provisional plans call for five 16-knot ships of about 9000 gross tons.

Single Screw Motorship Completes Sea Trials

The single screw motorship *ASHMORE*, built to the order of Skibs A/S Ashmore by Armstrong Whitworth & Co. Ltd. at their Tyne iron shipyard, Willington Quay on Tyne, completed her official trials at sea under fully loaded conditions and with satisfactory results recently.

One of new boats built by Jacobson & Peterson Inc. for public health service



Progressive runs over the measured mile course were carried out and at full power the mean speed obtained was in excess of that guaranteed.

The vessel is of the two-deck type with poop, bridge and forecastle with raked stem and elliptical stern, and is fitted with two pole masts.

She has an overall length of 408 feet, molded breadth of 54 feet 9 inches and is designed to carry a deadweight of 9000 tons at a draft of about 26 feet at a speed of 11 knots.

The main propelling machinery was constructed by Armstrong Whitworth & Co. Ltd. at their Scotswood Works,

and consists of a single screw installation with Armstrong Sulzer engine of the single acting, two cycle, air injection, port scavenging type, having six cylinders capable of developing 2250 brake horsepower when running at about 114 revolutions per minute.

The engine is enclosed, fitted with crossheads and provided with forced lubrication.

The main air compressor and scavenging pump are driven from an extension of the crankshaft. The cooling water pumps, lubricating pumps, bilge and sanitary pumps and separate lubricating pump for crosshead lubrication are also driven off the main engine.

One single ended cylindrical boiler suitable for burning oil under natural draught is provided for harbor duties,

and a small Cochran vertical type boiler for supplying steam at sea.

New Public Health Boat

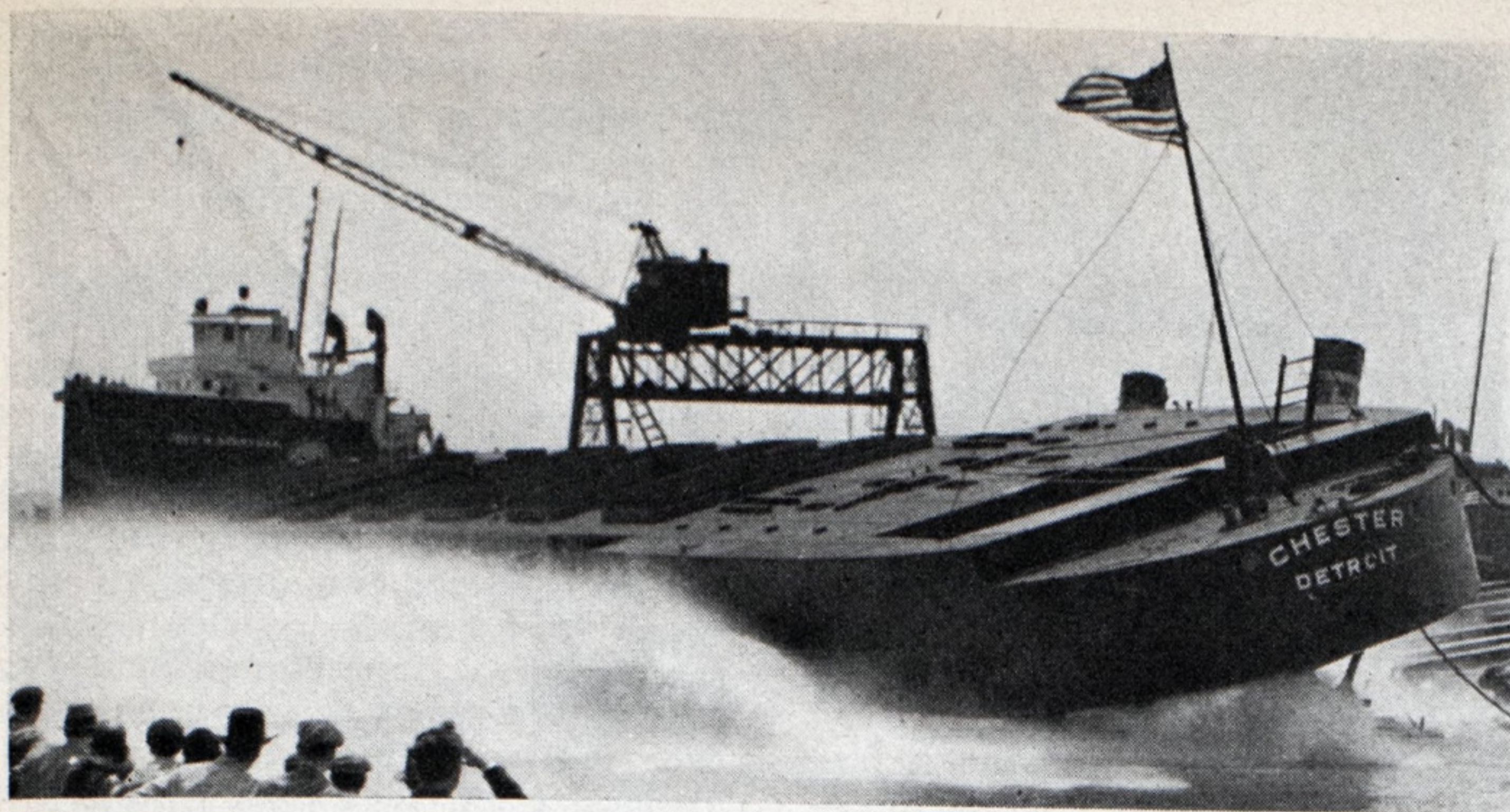
Shown in the accompanying illustration is one of the new boats recently completed by Jacobson and Peterson, Inc., Brooklyn, for the public health service foreign quarantine division from plans prepared by P. W. Clark, naval architect, United States public health service. Construction has started on four additional vessels of this type at the yard of Charles H. Stowman & Sons, Dorchester, N. J.

Canadian Survey Boat

The Collingwood Ship Yards Ltd. has been awarded a contract by the Dominion government for the construction and equipment of a hydrographic survey steamer for service on the Pacific coast, the price being in the neighborhood of \$600,000. She will be 214 feet in length, 36 feet wide, and 23 ft. 6 inches deep and fitted with all the latest appliances for marine survey work. There will be two triple expansion engines and boilers, giving a speed capacity of 12 knots.



Single screw motorship Ashmore recently completed by Armstrong Whitworth & Co. ran successful trials



Chester, new Ford Motor Co. cargo vessel launched at River Rouge, Mich.

Ferry Under Construction at Pusey & Jones Yard

The all-steel automobile ferry which is building at the Pusey & Jones Corp. plant at Wilmington, Del. for the Delaware-New Jersey Ferry Co. will be 206 feet long; 58 feet beam over guards; 16 feet depth; and draft of 10 feet 4 inches when loaded with 75 autos.

The propelling machinery will consist of one 925-brake horsepower 8-cylinder, double clutch ferryboat type engine built by the Washington Iron Works, Seattle, Wash. Auxiliaries will consist of one 25-horsepower diesel engine connected to an 18-kilowatt direct current generator and one 20-kilowatt variable speed constant voltage direct current generator connected to the main engine. There will also be one electric driven sanitary pump and one electric driven fire and bilge pump and an auxiliary air compressor also electric driven. The steering engines will operate with compressed air. The new ferry will be ready by Aug. 15.

A contract for the construction of ten steel barges has been awarded to the McClintic-Marshall Corp. by the Island Creek Coal Co. of Huntington, W. Va. The barges will be 200 feet long, 26 feet wide and 10 feet deep. They will have a capacity of 1000 tons each, on an 8-foot draft.

Electrical Equipment Order

A contract for the complete electrical equipment for a diesel-electric tugboat for the bureau of public health, United States treasury department, has just been awarded the Westinghouse Electric and Mfg. Co., according to an announcement by the company.

The complete electrical equipment consists of two 205-kilowatt, 250-volt 300 revolutions per minute, propulsion generators direct connected to two Fairbanks-Morse diesel engines which furnish power for the 500-horsepower 250 volt, per armature, double armature

175 revolution per minute, main propulsion motor. Excitation for the generators will be furnished by two 25-kilowatt, 125 volt, direct-current generators.

Complete switching and control equipment with both engine room and pilot house control stations, are included in the contract.

Launch Two New Ferries

The two latest additions to the department of plant and structures ferry fleet, the MURRAY HILL and WASHINGTON SQUARE, were launched at a double ceremony from the Tebo Yacht basin of the Todd Shipyards Corp., in Brooklyn, on Wednesday, May 27.

These vessels are of the 151-foot double-ended type, and are equipped with Todd oil burners. Each vessel has accommodations for 400 passengers and 25 automobiles. Following their trial trips, the boats will enter the Jamaica Bay and East river services.

The MURRAY HILL was sponsored by Miss Evelyn Wagner, niece of United States Senator, Robert F. Wagner, and was the first vessel to slide down the ways.

Fifteen minutes after the first launching, the WASHINGTON SQUARE followed her sistership down the ways, having been sponsored by Mrs. Alfred E. Smith, Jr., daughter-in-law of ex-Governor Smith.

Two New Ford Cargo Vessels Ready to Begin Service

The accompanying illustration shows the new Ford Motor Co. cargo vessel CHESTER, which was launched May 9, at the River Rouge plant of the Great Lakes Engineering Works. This vessel, with a second which was launched May 16, will be operated between River Rouge, Mich. and Edgewater, N. J.

Each vessel is 300 feet long; 43 feet beam; 20 feet molded depth; and 10 feet draft. The vessels will have cargo space for 2000 tons of boxed goods and will carry crews of 17 men. They will be powered with a pair of 800 horsepower geared turbines, steam driven from oil-burning boilers operating at a working pressure of 400 pounds per square inch and 200 degrees superheat. Both vessels were turned over to the owners June 1. They were designed by Henry J. Gielow Inc.

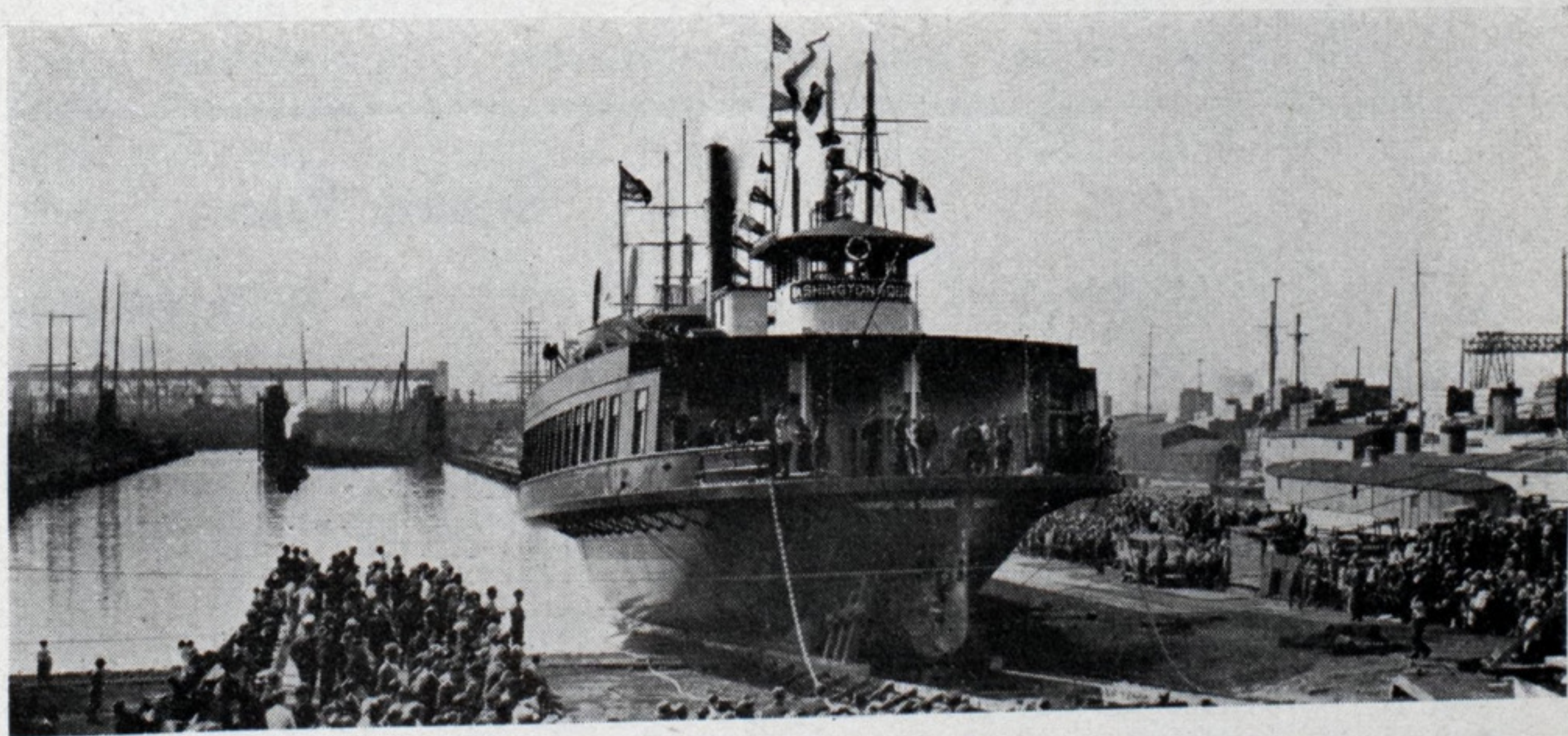
Sails on Maiden Voyage

The EXETER, one of four sisterships, built by the New York Shipbuilding Co., Camden, N. J. for the Export Steamship Corp., left the Camden yard, Friday, June 5. The EXETER sailed on her maiden voyage June 10.

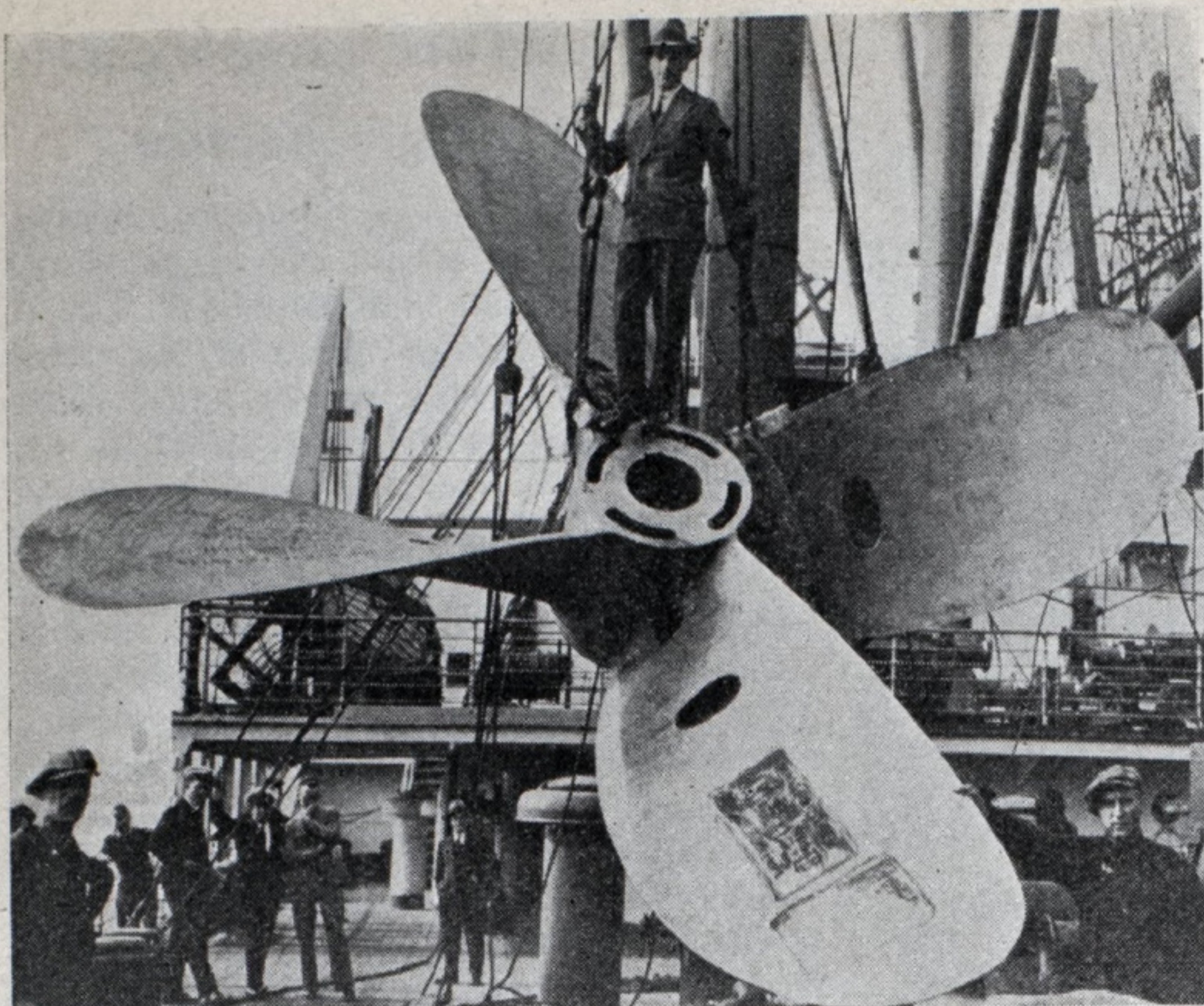
The new vessel is 475 feet long, 61 feet beam, and 42 feet depth. She is propelled by Parsons steam turbines of 8000 horsepower sufficient for a speed of more than 16 knots. She has a cargo capacity of approximately 6000 tons with 34,000 cubic feet of refrigerator space for perishable products. Accommodations are provided for 152 first class passengers, all in outside staterooms.

To Modernize Battleship

The battleship IDAHO will be modernized at the Norfolk navy yard, the work to begin about Oct. 1. The IDAHO is one of three ships to be modernized at an estimated total cost of \$30,000,000. Of the other two the work of modernizing the MISSISSIPPI has already been assigned to the Norfolk navy yard while the NEW MEXICO is to be remodeled at the Philadelphia navy yard.



New ferry boat Washington Square launched May 27 at Tebo Basin of Todd Shipyards Corp.



Seven-ton propeller of new design recently developed to reduce noise and vibration. Holes in blades permit air to escape through channels to hub

New Propeller Designed to Reduce Air Resistance

SHOWN in the accompanying illustration is a seven-ton propeller of new design which was recently brought to Montreal aboard the Cunard liner ALAUNIA. This propeller is to be installed on the Canadian freighter CORNWALLIS by the Canadian Vickers Shipbuilding Co.

This new propeller was developed by an officer of the Cunard line as the result of observation of rumbling sounds in the vicinity of the propeller of his own ship. As these noises were due to the collection of air near the propeller, the new design was developed to provide a means of escape for this imprisoned air. As shown in the illustration, this new type of propeller has four blades with grooves or channels along the blades through which air accumulated at the hub may find an exit. Holes are also bored through the hub of the propeller, making interference to the channels along the surface of the blades, thus enabling the air to escape at the tips of the blades.

Contract for Submarine

Contract for the construction of the U. S. S. CUTLEFISH has been awarded by the navy department to the Electric Boat Co., of Groton, Conn. on a

bid of \$3,297,000. The submarine CUTLEFISH will be 1100 standard London treaty tons.

The United States shipping board has authorized the sale of the LAKE GIRTH to the Schuylkill Transportation Co., of Philadelphia for \$10,000 cash with the understanding that the vessel will be converted to a barge.

Plan Three More Ships

The Johnson line of Gothenburg is reported to be planning the construction of three more vessels for its Pacific Coast-Europe service at a cost of about \$2,500,000 each. The company is represented on the Pacific coast by W. R. Grace & Co. as general agents. Capt. Ragnar Snobhom, formerly agent for the Johnson line at Hull, England, has been appointed special representative of the company on the Pacific coast.

Bids on Engineers Equipment

The United States engineer office of Wilmington, N. C. opened bids June 23 for one steel barge approximately 80 feet long, 26 feet wide and 6 feet deep. The specifications call for a barge suitable for transporting either fuel oil or coal and shall have at least four oil-tight compartments formed by one

centerline longitudinal bulkhead and three transverse bulkheads. Two four-inch equalizing valves shall be located in the longitudinal bulkhead as near the bottom and as near the end bulkheads as possible.

The Marietta Mfg. Co. was low bidder on two 34-inch steam driven side wheel pipe line dredges for the war department, bids for which were opened June 2 by the chief of engineers, Washington. The low bid was \$442,000 for one dredge in 270 days and \$850,000 for two dredges in 315 days. Other bidders included the Chicago Bridge & Iron Works, \$1,036,000 for two dredges in 365 days; the Ellicott Machine Corp., \$1,044,716 for two dredges in 360 days; the Ellicott Machine Corp., \$1,044,716 for two dredges in 360 days; The Dravo Contracting Co., \$966,000 for two dredges in 350 days; and the Charles Hegewald Corp., \$591,777 for one dredge in 540 days.

The office of the chief of engineers, war department, Washington, was to have called for bids about July 1 for one steam driven stern wheel river dredge. Length overall will be 224 feet 1½ inches; breadth overall, 45 feet 1½ inches; depth molded, 7 feet; draft, 4 feet 1 inch. The dredge will be of the sternwheel type. There will be a 24-inch electric driven dredging pump. The auxiliaries will be driven by steam and electricity. Steam will be supplied by water tube boilers. The hull will be of all-steel construction with main deck house also steel, and upper deck and houses of wood.

Vickers Ltd. of England the parent company of Canadian Vickers Ltd. is considering the expansion of its operations in the Dominion. A survey of the opportunities presented in Eastern Canada is being made by Commander C. W. Craven managing director of the shipyards accompanied by J. Reid—Young secretary of the company.

Cruiser Names Announced

The name of U. S. S. TUSCALOOSA to light cruiser No. 37 now building at New York Shipbuilding Co., Camden, N. J., and the U. S. S. SAN FRANCISCO to light cruiser No. 38 now building at navy yard, Mare Island, have been assigned.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
June 18, 1931	4.85@5.25	.90	3.84½
May 18.....	4.85@5.25	1.00	4.08
April 18.....	4.85@5.25	1.10	4.32
Mar. 18.....	4.85@5.25	1.10	4.55½
Feb. 18.....	4.85@5.25	1.10	4.55½
Jan. 18.....	4.85@5.25	1.10	4.55½
Dec. 18.....	4.85@5.25	1.10	4.55½
Nov. 18.....	4.85@5.25	1.10	4.92
Oct. 18.....	4.85@5.25	1.10	4.92
Sept. 18.....	4.85@5.25	1.10	4.92
Aug. 18, 1930	4.85@5.25	1.20	4.92

At Philadelphia

	Coal trim in bunk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
June 18, 1931	4.85@5.25	.90	3.80
May 18.....	4.85@5.25	1.00	4.4
Apr 18.....	4.85@5.25	1.00	4.60
Mar. 18.....	4.85@5.25	1.00	4.88
Feb. 18.....	4.85@5.25	1.00	4.88
Jan. 18.....	4.85@5.25	.85	4.88
Dec. 18.....	4.85@5.25	.95	4.88
Nov. 18.....	4.85@5.25	1.00	4.88
Oct. 18.....	4.85@5.25	1.05	4.88
Sept. 18.....	4.85@5.25	1.05	4.88
Aug. 18, 1930	4.85@5.25	1.05	4.88

Other Ports

Boston, coal, per ton..	\$7.22
Boston, oil, f. a. s., per barrel.....	1.10
Hampton Roads, coal, per ton, f.o.b., piers	\$4.35 to 4.50
June 9—Cardiff, coal, per ton.....	13s 6d
London, coal, per ton... —s —d	
Antwerp, coal, per ton..	18s 6d
Antwerp, Fuel oil, per ton.	67s 6d
Antwerp, Diesel oil, per ton.....	82s 6d
British ports, Fuel oil..	67s 6d
British ports, Diesel oil.	82s 6d

New System of Tank Cleaning Saves Time and Expense

By L. E. Browne

TANK cleaning is one of the most offensive and difficult problems in the transportation of crude and refined oils and chemicals by water. Gas-freeing and tank cleaning by a crew with hand hose is a tedious, long and expensive operation.

Progress in elimination of time, expense and danger with additional advantages of better cleaning has attracted much interest on the part of tanker owners and operators in the system of tank cleaning developed by Butterworth System Inc., Bayonne, N. J. A group of oil shipping operators attended a demonstration of the machine manufactured by this company on the T. J. WILLIAMS owned by the Standard Shipping Co. at Bayonne, N. J., recently. The system has been adopted on the tankers of the Standard Shipping Co., the Sinclair Navigation Co. and numerous other tankers.

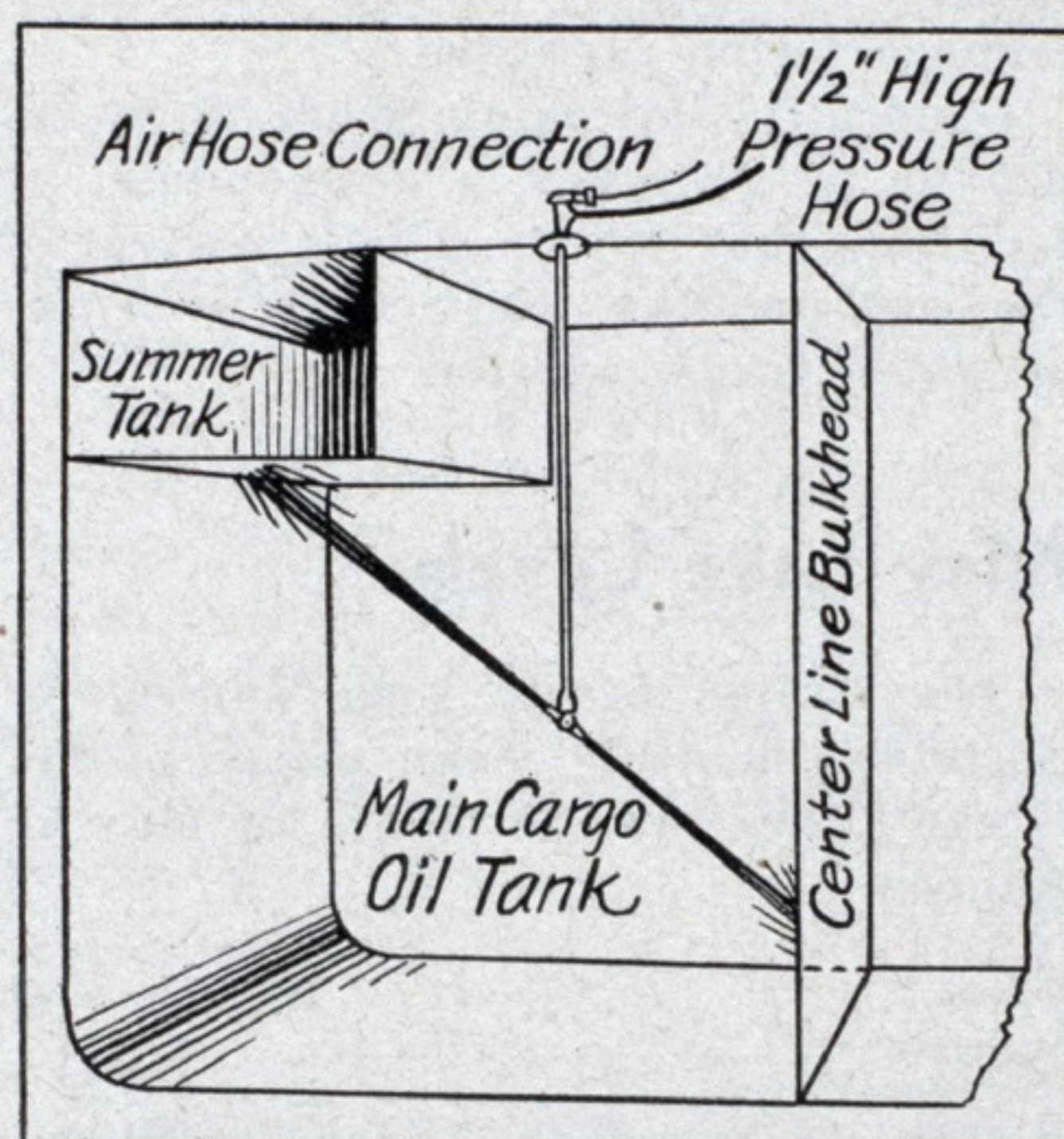
This system makes it unnecessary for men to enter the tanks until they are gas-free and dry. Tanks are washed by a machine with heated water directed against the plates of the interior of the tanks in a solid stream at high pressure from revolving nozzles.

The machine is projected into the tank from a small hole in the deck. The deck hole is so placed as to prevent fouling of ladders and beams by the nozzles, there being two nozzles on each machine. The machine is operated by an air motor, easily attached, although it should not be in place except when the machine is not operating. The nozzles are a fixed part of the machine, which, when the equipment is in place, reaches down to about one half the depth of the tank, and as near the center as possible. Nozzles turn slowly on a horizontal and perpendicular plane, the direction of the water stream changing with each revolution. As a result, the stream eventually reaches every part of the interior surface of the tank.

The system provides for ship installation of its own hot water plant, all equipment being available on the tanker. Circulating water from the condenser at approximately 110 degrees Fahr. is sent to two evaporators in series. The temperature is gradually raised from 160 to 175 degrees. It may be pointed out here that a hand hose crew could not handle a line of this temperature, much less one with a pressure of 175 pounds, which is the force at which this water is thrown. It is also important to note that a solid stream of water hits the interior

chambers of the tank, and not a spray.

The evaporators connected in series the steam and water pass through in opposite directions. Steam is admitted to one evaporator, its condensate and excess steam led to another which receives the warm water direct from the condenser. From the second evaporator the condensate is led to the hot well and, as a result, no fresh water is lost to the system. After passing through both evaporators, the hot salt water goes directly to the fire pump which discharges into the 3-inch fire line at about 175 pounds per square inch. To provide a reserve heating capacity for the water, provi-



Diagrammatic Sketch Showing Tank Cleaning Machine in Operation in Main Cargo Tank

sion is sometimes made to inject live steam into the 3-inch line; but with both evaporators operating, the live steam injection is hardly necessary.

About 400 gallons of hot water a minute is driven on the tank plates. Sediment and oil residue are flushed into the suction of the cargo pumps which may discharge overboard at sea or into salvage tanks. Under this system of tank cleaning best results may often be had at sea.

Pipe standards for most deep main tanks are about 20 feet long while for summer tanks they are shorter, generally around seven feet in length. The interior shaft connected with the nozzles and operated on deck by the air motor revolves slowly. Best results are found in operating the air motor at the lowest possible speed which is approximately one revolution per minute of the nozzle shaft.

With employment of this system, it is claimed that a large tanker can be gas-freed in from 20 to 36 hours

and that tanks can be cleaned from black to refined oil in from three to six days. Condition of tanks and type of oil previously carried naturally are important factors as to time required. Two men of the ship's personnel can operate and perform all the labor required, the only work being that of shifting the machine from one tank to another. The machine also removes rust scale, retarding corrosion and eliminates the need of steaming. During cleaning operations tanks are well stripped, keeping bottoms free of water thus realizing the full force of the streams on the tank bottoms, which results in the breaking up of rust scale so that it is pumped out with the water.

When cleaning from black to refined oil it is sometimes necessary to wash with kerosene or furnace oil. For this only a comparatively small amount of cleaning oil is required and it is circulated through cleaning machines at high pressure in the same way as the water.

All parts of the machine from the operating air motor on the deck are of brass or bronze with the exception of the shaft which is steel. This eliminates the danger of sparks while raising or lowering the machines into the tanks. When not in use machines are carefully stowed on racks to prevent damage from bending or otherwise. After each cleaning operation air motors should be cleaned, filled with grease and stored in a dry place.

To Get Mexican Subsidies

Ocean going and coastwise passenger and freight ships of Mexican registry and which have Lloyd's or other similar classifications, and which can develop a minimum speed of seven knots, will receive subsidies from the Mexican government under new merchant marine regulations that have been decreed by President Pascual Ortiz Rubio. The regulations specify that the owners of ships seeking these subsidies, which will vary according to the class of ship and allotments for this purpose made in the federal annual budgets, must make contracts with the ministry of communications and public works, Mexico City, in which the tonnage and other specifications of the craft will be given.

The steamship LEVIATHAN, flagship of the United States lines, will make a summer cruise to Halifax, N. S., July 23, returning July 27, in accordance with authorization granted by the shipping board on June 10. The cruise will in no way affect the regular schedule of sailings maintained under the sales contract transferring the United States lines to their present owners. This cruise will mark the first appearance of the world's largest ship in a Canadian port.

Up and Down the Great Lakes

Establish Port Commission—Lake Levels—Begin Harbor Work—Coal Dumping Lags—
Welland Canal Open to Larger Vessels—Ore Movement Drops—New Canal Service

HOPE of completing the Illinois river link of the Great Lakes-to-Gulf waterway by late in 1932 is expressed by war department officials, who expect to make faster progress from now on. Thus far, \$5,665,000 has been allotted for carrying on the Illinois project, of which \$3,400,000 has not yet been expended.

Further allocation of funds is expected next spring. The total authorization for the Illinois river project is \$11,000,000. Of this sum, \$5,400,000 has not been allocated. As the rivers and harbors appropriation is voted by congress in a lump sum, it will be possible for the United States engineer corps to advance the money for construction work as rapidly as it can be expended. The plan now is to supply funds to the engineers as it can be used.

The engineer corps is working also on a survey of the lower Illinois river to determine what canalization work must be done to insure a 9-foot channel in the event the water diversion from Lake Michigan is cut down to any considerable amount below the present flow.

Establish Port Commission

Approval of a bill passed May 20 by the Illinois legislature officially establishes a Chicago regional port commission in preparation for the opening of the Illinois river's 9-foot channel. Both Illinois and Indiana were to adopt enabling legislature and each state was to appropriate \$15,000 for a port commission, according to the plan intended to develop a permanent interstate port authority.

Jurisdiction of the port commission covers wharfage and harbor facilities from Wisconsin south past the Chicago waterfront and down to the Indiana state line. The Indiana group of the commission will function for the lower end of Lake Michigan. The scope of the interstate commission embraces the territory between Waukegan, Ill., and Michigan City, Ind., and an imaginary line connecting Waukegan, Elgin, Aurora, Joliet, Chicago Heights, Ill., and Laporte and Michigan City, in Indiana.

The personnel of the Chicago regional port commission is to be recommended by the Chicago association of commerce. The port commission law authorizes the organization to perform the following services:

To act as a clearing house for all

water terminal proposals in the metropolitan district.

To study existing harbor plans and to consider such changes and modifications as may be necessitated by the growth of the district and by changing business and commercial needs.

To make recommendations to the proper authorities as may be needed to carry out an early terminal scheme.

To study and recommend in the form of specific proposals the establishment of a permanent port authority for the district

To act in an advisory capacity in matters pertaining to port and water transportation facilities.

Generally, the commission is to endeavor to stimulate a development of facilities that will lead to a revival of the metropolitan district as a center of water transportation.

May Lake Levels

The United States Lake survey reports the monthly mean stages of the Great Lakes for the month of May as follows:

Lakes	Feet above mean sea level
Superior	601.74
Michigan-Huron	579.12
St. Clair	574.19
Erie	571.46
Ontario	245.13

Lake Superior was 0.20 foot higher than in April and it was 0.50 foot lower than the May stage of a year ago.

Lakes Michigan-Huron were 0.07 foot higher than in April and they were 1.85 feet lower than the May stage of a year ago.

Lake Erie was 0.33 foot higher than in April and it was 2.53 feet lower than the May stage of a year ago.

Lake Ontario was 0.16 foot higher than in April and it was 2.94 feet lower than the May stage of a year ago, 1.36 feet below the average stage of May of the last ten years.

To Start Harbor Work

Harbor work at Milwaukee, Wis., totaling about \$3,000,000 is expected to start soon. All of this will be in construction in the city's outer harbor. Among the projects is one of the Milwaukee harbor commission on seven Jones island projects, which will cost \$1,300,000.

The Milwaukee sewage commission is scheduled soon to start on

a \$400,000 job toward erection of a bulkhead and slip for the harbor commission in return for exchange of land. The city also has contracted for a \$1,110,000 project for the Bay View property of the Illinois Steel Co., the exact amount of the work depending upon negotiations between the city and the steel company for the purchase of the Bay View property. A part of the plan includes construction of a bulkhead and filling of land to be given the steel company in exchange for the company's transfer of a similar area to the harbor commission.

Coal Dumping Lags

According to the report of the ore and coal exchange issued June 3, the dumping of bituminous coal continues to lag behind last year. The total net tonnage dumped for the week ending June 1 amounted to 900,188 net tons as compared with 1,387,595 net tons for the same week in 1930.

The record for the season thus far is shown to be the lowest for the last four years. Total dumping for the season to June 1 was 4,684,050 net tons as compared with 8,233,029 net tons for 1930; 8,354,812 net tons for 1929, and 5,746,090 net tons for 1928. Compared with 1930 and 1929 dumpings, the 1931 figures show a great decrease.

Chart of Radio-Beacons

Announcement is made by the lighthouse service of the United States department of commerce that a new chart of all the radio-beacon stations on the Great Lakes, both American and Canadian, has been issued. This is available to Great Lakes navigators.

Code signals, name of stations, the period when each station is in operation and details as to frequency and power are identified on the new chart. It is estimated that radio-beacon signals now are used in the navigation of about three-fourths of the Great Lakes' vessels. About that proportion of the vessels are reported equipped with radio compasses.

According to E. H. McCracken, passenger traffic manager, the Detroit & Cleveland Navigation Co., will operate the steamers EASTERN STATES and WESTERN STATES between Detroit and Chicago by way of Mackinac island and St. Ignace beginning June 30.

Welland Canal Opened to Larger Lake Vessels

The new Welland canal was officially opened, June 15, to lake freighters up to 450 feet in length. The first lake boats to pass through the canal were the THOMAS BRITT, the JAMES EADS and the BRENTWOOD. The THOMAS BRITT is 412 feet, and the BRENTWOOD 358 feet.

Dredging operations are still in progress at several points, including a point at bridge No. 11 at Allanburg; bridge No. 12 at Port Robinson where dredging and other construction will be going on until the end of August; a point two miles north of bridge No. 13 at Welland, where dipper dredges are working; a point between bridges 16 and 17 where a suction dredge is at work; a point at Ramey's Bend where dredging is being done; and at Port Colbourne harbor where dredging operations are also being carried on.

River Bend Elimination

According to a report from Lorain the Lorain port commission on June 17 was called on to file an appeal with the United States war department engineers urging that the work of eliminating the bend in the Black river be finished this summer. Part of the work was completed June 17, by the Dunbar & Sullivan Co., which was working under a contract. According to the Lorain port commission, the elimination project is only two-thirds completed. The work on the section which embraced about 1100 feet of

river front was carried out on a contract price of about \$48,000 with an available \$66,000 appropriated by congress last year.

The port commission claims that a menace to navigation is caused by considerable piling which extends into the river where work on the completed section terminated. Work was resumed Monday, June 22, to complete the project and it is this work which the commission is anxious to have completed.

The passenger service of the Great Lakes Transit Corp. is to include Chicago and Milwaukee during the present season according to William J. Connors, Jr., chairman of the board of the company. This extension is to become effective in July.

Open New Barge Service

The Inland Waterways Corp. began service on the Illinois river as far as Peoria on June 11, the first fleet leaving St. Louis on that date and arriving at Peoria on June 15.

The opening of operations on this river marks an important step toward the culmination of the long dreamed of Lakes to the Gulf waterway, extending from Chicago to New Orleans, and has been made possible through the co-ordinated efforts of the federal government and the citizens of Peoria, who have invested nearly a half million dollars in a modern interchange terminal between water, rail and motor facilities, the first to be constructed on the Illinois river.

Movement of Ore Drops Below Last Season

Movement of iron ore from the Lake Superior district during the month of May was only slightly over 25 per cent of what it was for the same month last year. Shipments for May, 1930, amounted to 6,979,213 tons and for May, 1931, the total movement was 1,769,295 tons or a decrease of 5,209,918 tons. This drop amounts to 74.65 per cent. In spite of the fact that the movement during April of this year was greater than for the same month in 1930, the total seasonal movement to June 1 is 72.55 per cent below last year's record. The movement to June 1, 1930, amounted to 7,087,132 tons as compared with 1,945,216 tons for this year. Movement of ore to interior furnaces from Lake Erie docks for the month of May, was below the figure for the same month last year. During May, 1931, 13,017 cars were shipped while for last year 54,666 cars were moved during the same month.

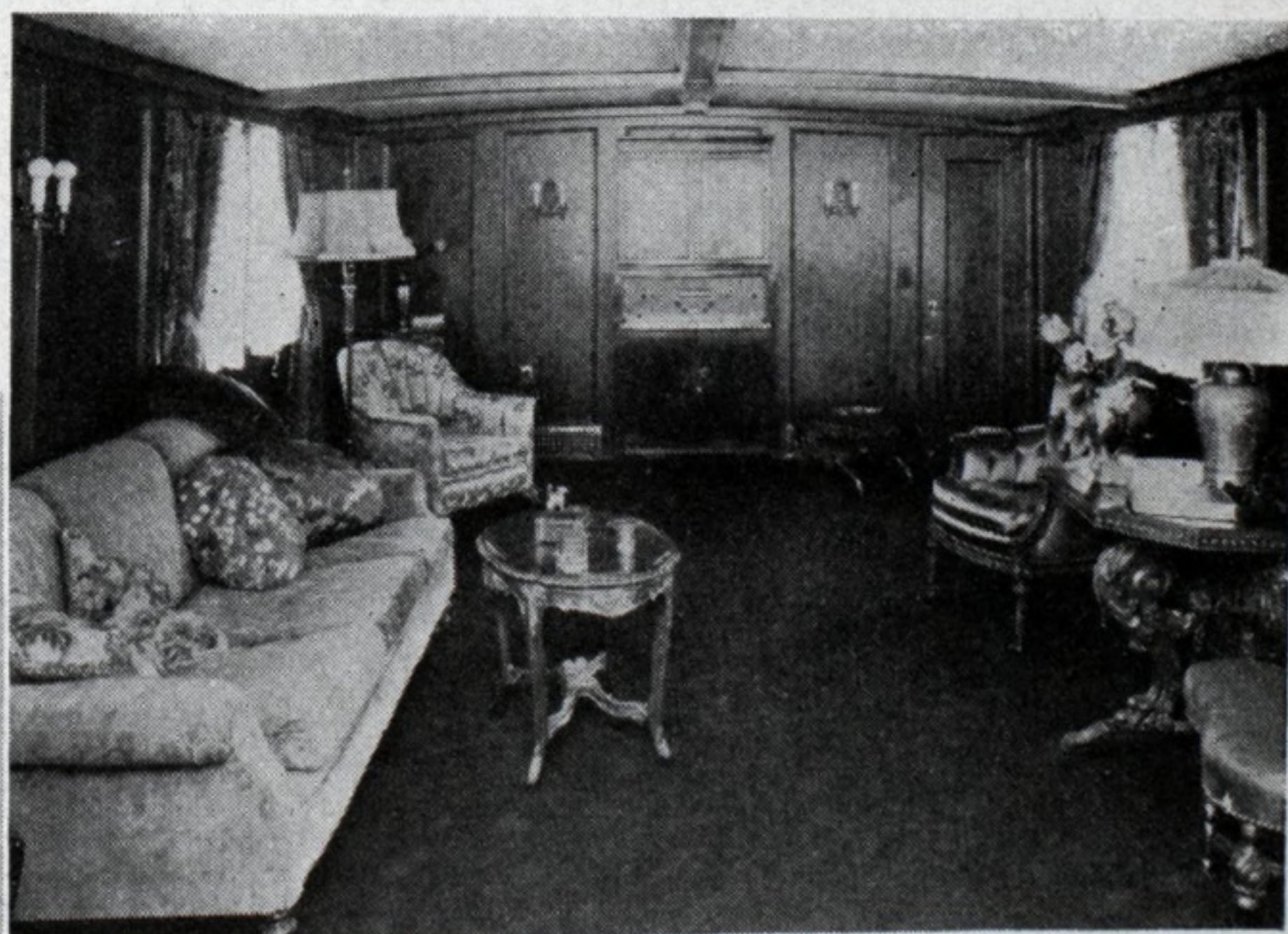
New Canal Service

The electric drive barge CLEVELANDER of the General Motorship Corp. arrived at Boston, June 17, to load 30,000 bags of sugar at the Revere Sugar Refining Co.'s plant for delivery at Rochester, Buffalo, Chicago and Detroit. The DETROITER of the same line is scheduled to make a similar trip via the Cape Cod canal, Long Island sound and the state barge canal and it is expected that a regular service may be maintained.

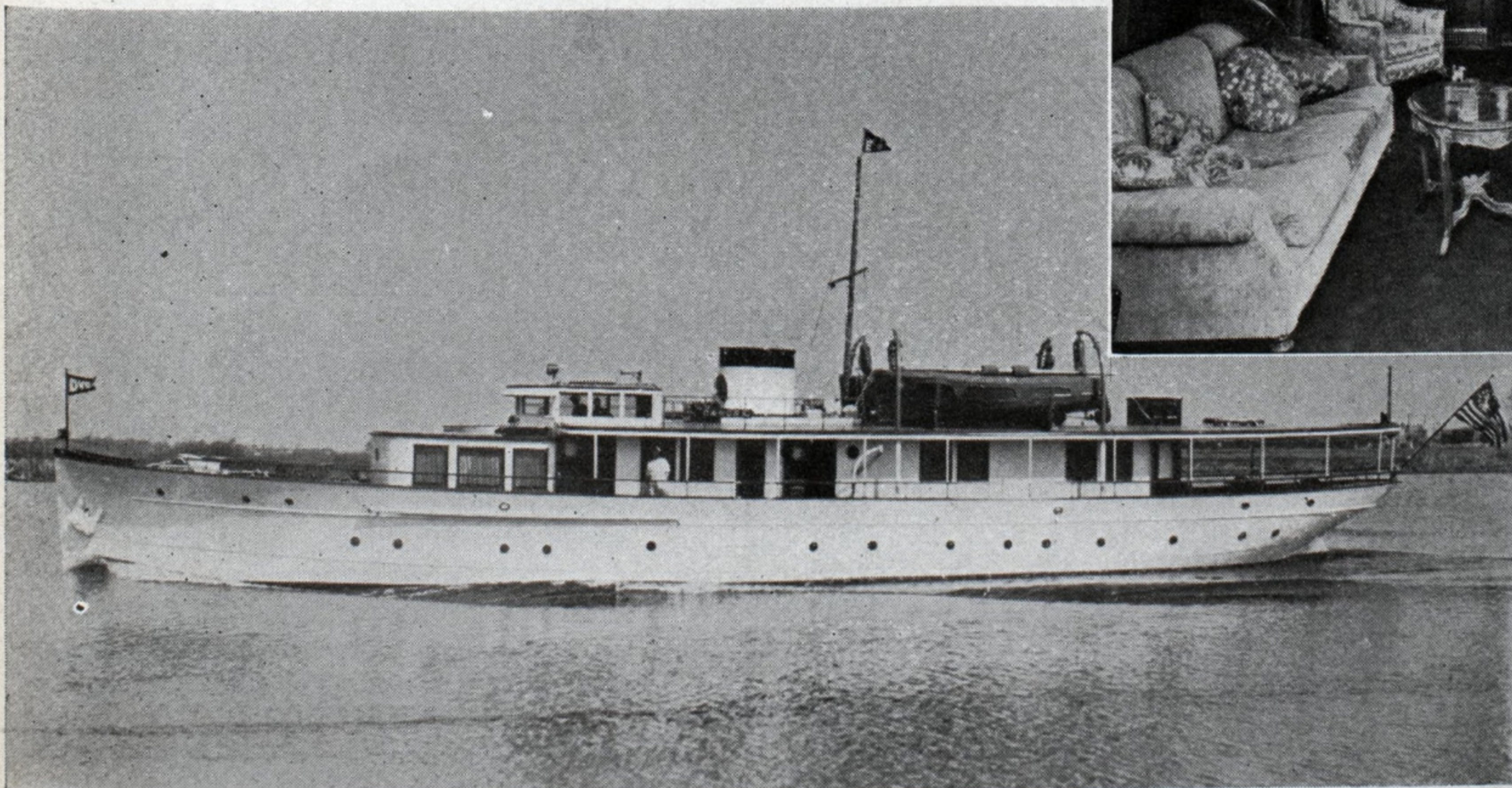
New Diesel Yacht Completed for Use on Great Lakes

SHOWN in the accompanying illustration is the new diesel yacht DANORA, designed by John H. Wells Inc. and built by the Defoe Boat & Motor Works, Bay City, Mich. for D. S. Eddins, Lansing, Mich. Principal di-

mensions are: Length 105 feet, beam 19 feet 6 inches, draft 6 feet 6 inches, powered with 2 Winton 375-horsepower diesel engines.



Left—Diesel yacht Danora recently built by Defoe Boat & Motor Works for D. S. Eddins, Lansing, Mich. Above—The living room, paneled in black walnut



Bulkhead Doors and Elevators Electrically Controlled

THE steamship FLORIDA, built by the Newport News Shipbuilding & Dry Dock Co., and delivered May 20, 1931 to the owners, the Peninsular & Occidental Steamship Co., is equipped with the most modern electrical appliances. The FLORIDA was described and illustrated in the June issue of MARINE REVIEW. Two interesting features of this modern passenger and freight steamship are the watertight door system and the elevators for automobiles and cargo.

The horizontal and vertical watertight bulkhead doors below decks are provided with electric operation. The Newport News-Cutler-Hammer modern watertight door control is used. Quick and positive action of the doors in any crisis is insured. While this system has been in use for the past several years, it is said to incorporate features of design which are in full accordance with the latest ruling of the International Conference on Safety of Life at Sea.

Finger-tip control of each door is provided by local control at the door itself and remote control in the pilothouse. The local control station, which is of the waterproof type, permits operation of the door from either side of the bulkhead either for opening or closing the door or for locking it in a closed position. When the door reaches the full open position, the master switch in the pilothouse takes precedence over the local control switch and the door will automatically close. Also at any time that the local control station is not being operated, the master control takes precedence, hence the system is always completely controlled by the master station.

The master control station consists of monel metal plate on which is etched the outline of the ship with the location of doors shown in diagram. A master switch is provided to close or open all doors and an individual switch is furnished for each door for use in case it is not desired to open all doors simultaneously. Red and green indicating lights are provided to show the relative positions of each door, viz., open, during travel, or closed.

Electrical operation of the doors does not interfere in any way with the usual manual operation as the system provides that the manual control be operated at all times when the doors are not being electrically operated. This is accomplished by a positive action solenoid, arranged to declutch the hand gear the moment the electric system is operated.

The motor unit for the operation of each door is located adjacent to the

door. Of waterproof construction, it employs a high starting torque motor of ample capacity. When the switch is closed, the motor comes up to speed before engaging the door mechanism with a sharp impact to free it and start it opening or closing. This motor unit consists of the driving motor, reduction gears operating in oil, limit switch mechanism, and solenoid operated pawl.

These are mounted in a single case conveniently arranged for securing to bulkhead. When the door is started the internal gear revolves without load until the stop is brought up against the pawl which arrests the movement of the internal gear and produces a positive unseating blow. It is said that sticky or gummed doors present no obstacle to this unit. When the internal gear stops the slow speed motor driving shaft revolves to close or open the door until the limit of travel is reached. When the door is firmly closed or opened the proper limit switch opens the solenoid circuit permitting the restraining pawl to be quickly withdrawn by spring action. The slow speed parts and door parts come to a stop immediately without jamming and simultaneously the motor is disconnected from the circuit. When the restraining pawl is withdrawn the internal gear is free to revolve with the planetary gear system, thus absorbing the momentum and bringing it quickly to rest.

The limit switches are of the quick break type constructed with husky finger contacts. The switches are operated by a train of reduction gears driven by the slow speed shaft and are provided with accurate settings. A waterproof reversing relay panel is provided with each door unit. This reversing panel consists of a sheet steel watertight box containing an asbestos lumber panel on which is mounted two main double pole line contactors with mechanical and electrical interlocks. There is also a double pole line fused knife switch.

For handling automobiles and freight the FLORIDA is equipped with electrically operated winding drum type elevators supplied by M. L. Bayard Co. The main elevators are operated by 45 horsepower, 115 volt direct current marine type motors each fitted with a 14-inch magnetic pedestal mounted shoe brake. The motors were designed and manufactured by the Diehl Mfg. Co. The control equipment for the operation of the elevators consists of a single unit of the Cutler-Hammer magnetic type arranged for dynamic lowering control. Each controller is mounted in a

rugged sheet steel enclosing case for deck mounting and is provided with a throw-over switch for connecting to either No. 1 or No. 2 motor as the case may be. Operation of the magnetic controller is provided by means of remote control locked waterproof pushbutton station. Up and down hatchway limit switches are included and also a traveling cam machine type limit switch.

The auxiliary elevators are operated by 25-horsepower, 115 volt, direct current motors, each with 10-inch pedestal mounted shoe brakes and separate control. The type of control for the auxiliary elevators is similar to that of the main elevators except that no transfer provision is included. The resistors for all of the elevator equipment are provided for separate mounting and are of the cast grid marine type especially designed to prevent corrosion. The entire controller layout includes special features of design for the contactors and relays and insuring satisfactory operation even though the vessel may be rolling or pitching.

Named American Agent for Foreign Products

Selby, Battersby & Co., Thirty-third and Arch streets, Philadelphia, have been appointed sole agents in the United States for Robert Bowran & Co., Ltd. in the sale of Bowranite colored bitumen paints for decorative rust prevention and for Kauxeme used for calking the wood decks of ships.

Bowranite has been used effectively in the British Isles, India, Australia and Egypt as a bitumen paint that is unaffected by climatic changes. It is furnished in a variety of colors and retains all the protective qualities of real bitumen.

Kauxeme has been successfully used by the larger shipbuilders in the United States and by practically all shipbuilders in the British Isles. It does not boil out of seams in the tropics nor does it become brittle in arctic weather. Kauxeme was used on the Panama Pacific liners CALIFORNIA, VIRGINIA and PENNSYLVANIA and has been bought for the new Matson liners building by the Bethlehem Shipbuilding Corp., Quincy, Mass.

April Canal Traffic Low

Commercial traffic through the Panama canal during the month of April was the lowest April traffic with respect to the number of transits and net tonnage since 1926, 453 vessels aggregating 2,292,805 tons passing through the canal, as compared with 425 vessels aggregating 2,048,247 tons for April, five years ago.

Turbine or Diesel Drive in Stern Wheel River Boats

WHEN the attempt is made to install in river boats modern machinery involving either steam turbines or diesel engines connected directly or by means of electric transmission to the stern wheel, those making the installation are confronted with the problem as to how to effect the mechanical connection between the prime mover or the electric motor, and the wheel.

In small sizes this has been successfully accomplished by means of shafts and gears, or chains, but these are said to offer great difficulties when applied to boats demanding 1000 to 2000 horsepower and over. With the large torques involved in consuming this horsepower at speeds of 15 to 30 revolutions per minute, it is not surprising that this feature has been a cause for concern. After careful analysis, several groups studying the problem independently have arrived at the conclusion that the use of connecting rods, or pitmans, offers the most satisfactory solution. This type of connection has been successfully used for many years with the old grasshopper type of steam engine and has demonstrated its merit.

However, difficulty arises with the pitman type of connection in applying any type of modern power which delivers practically a uniform torque throughout a revolution of the wheel. In the case of the grasshopper reciprocating engine, steam is cut off before the end of the stroke and the idle pitman is carried over the dead center by the working one. However, with any type of motive power delivering practically constant torque, there is grave danger that during maneuvering the driving cranks on either side of the boat will be in opposition to each other. This is due to the clearances which naturally develop in the bearings and which will permit of a driving crank, when near dead center, dropping by and causing a cramping action. This analysis is by no means based on theory only, as actual experience has been had with electric locomotive design incorporating similar features.

A solution for this problem has been worked out by the General Electric Co. which it believes meets the requirements fully. The idea is to install in the pitman a hydraulic connection, shown in Fig. 1. In this illustration, A is the forward end of the pitman and B is, in effect, this forward end made to surround and include the driving crank. The driv-

ing effort of the crank is delivered through the connecting rod H, to which is attached a piston D. This piston works in a cylinder C filled with a hydraulic medium, such as oil. Mounted on top of the cylinder is a piston valve E, which is actuated by the crank through the linkage F. During the advantageous working angle of the crank, the two ends of the cylinder on either side of the piston are sealed off from each other by the valve E, so that a rigid connection is maintained; as the crank approaches dead center, the two ends of the cylinder on either side of the piston are interconnected, so that the piston is allowed to float freely, thereby permitting the working pitman to carry the other past dead center, much as is the case with the grasshopper type steam engine. The portions of the mechanism filled with the hydraulic medium are all self-contained; that is, there is no piping external to the device itself.

A reserve supply of oil is contained in the valve chest, which is used to keep the working passages filled as any slight leakage may occur; this is accomplished through the medium of a piston actuated by spring K. For the purpose of indicating the necessity for refilling the system, the stem of the piston upon which the spring K operates is brought external. The makeup medium may be supplied without disassembling the mechanism, through means of an ordinary hand pump. As the forward end of the pitman

is made to surround the crank, as illustrated at B, there is no tendency for the pitman to buckle due to the interposition of the hydraulic link between the driving and the driven members.

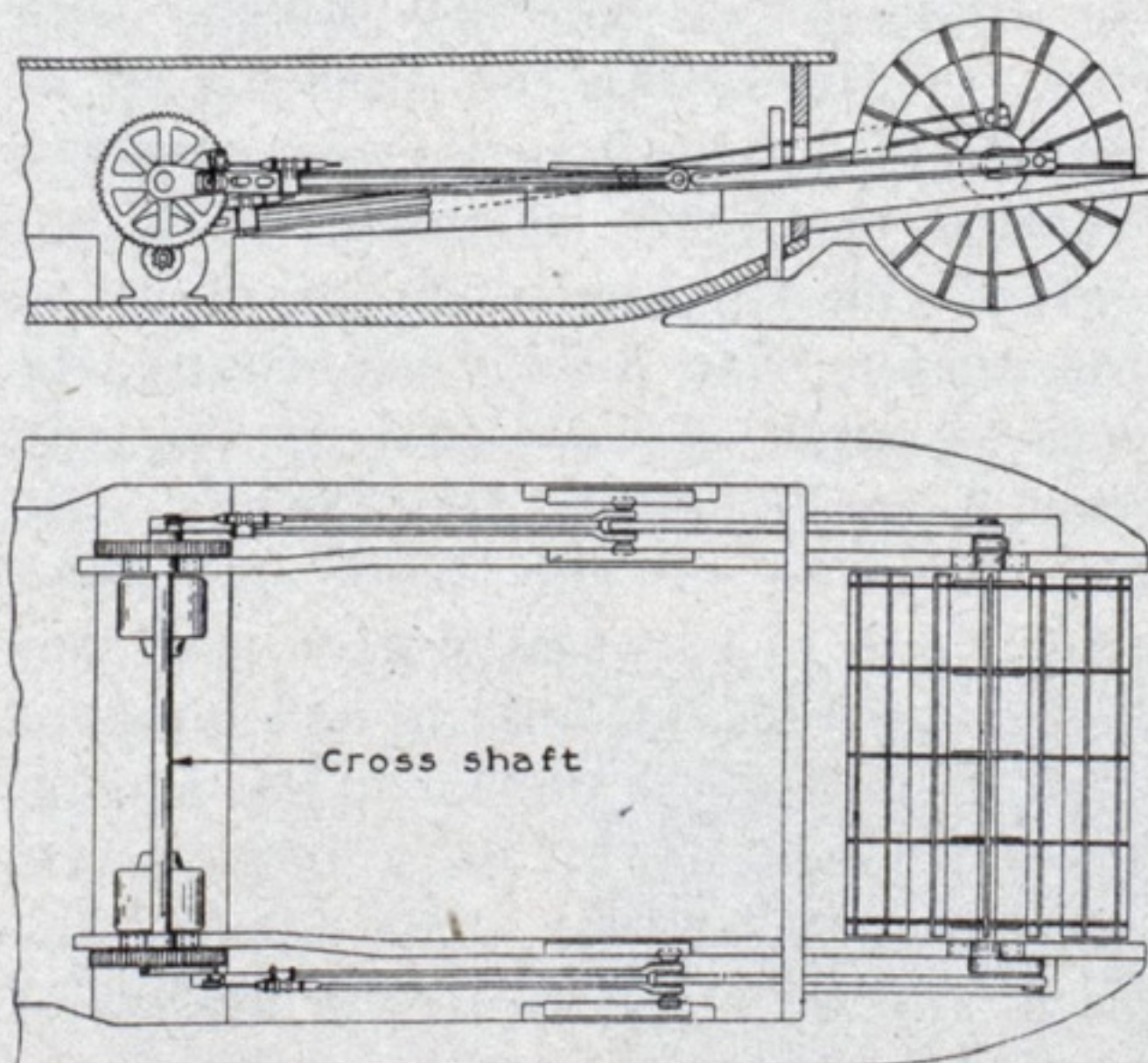
This arrangement has the additional advantage of setting a definite limit to the stresses set up in the crank pins, pitman, etc. This is due to the ability to choose the point at which the load is relieved on side approaching dead center.

It should be understood that with this arrangement the driving cranks will be cross-connected; that is, electric motors or other constant torque motive power will not be independently connected to the driving cranks. If this cross shaft were not provided, its individual motor would accelerate each crank a little when it became idle and as each dead center was passed, until all the clearance provided for by the hydraulic connection would disappear. The cross-shaft may be placed at any convenient point in the reduction system between the motor and driving cranks, so that it may be placed below the deck and remove the objection that it interferes with the use of this space for stowing cargo or other purposes.

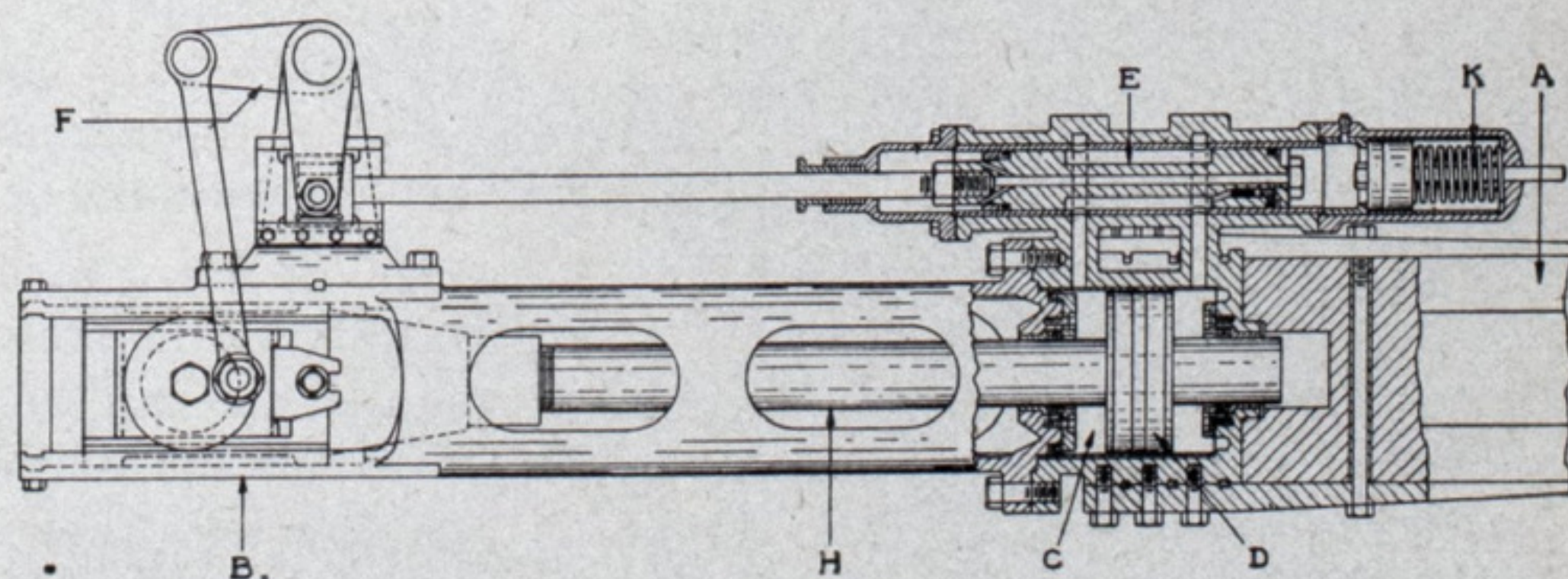
In Fig. 2 an arrangement is shown whereby the weight of the motors and gearing is placed well forward. This is understood to be a very desirable feature for this type of boat. As the ordinary pitmans would be too long with such an arrangement, they are shown divided in two parts and supported at approximately their center points by sliding crossheads.

Foreign Traders Meet

The eighteenth annual convention of the National Foreign Trade Council was held in New York on May 27, 28 and 29. Delegates from every state in the union and from foreign countries attended, giving the meeting an international significance. An excellent program of papers was read at both the general and group sessions. Chairman James A. Farrel opened the convention with an address on the world trade outlook. Subjects covered in the group sessions included export merchandising, imports, co-operation in export trade, credits and credit information, export advertising, and foreign trade banking.



Right — Fig. 1 — Hydraulic connection installed in pitman. Above — Fig. 2 — Arrangement of motors and gearing installed well forward



The Importance of Welding in the Building of Ships

ALTHOUGH welding has been making steady progress in the fabrication of ships during recent years, one feature, the foundations for machinery, for some unexplainable reason has been largely overlooked, according to engineers who discussed this subject at the annual meeting of the American Welding society at New York recently.

G. H. Moore, Jr., Newport News Shipbuilding & Dry Dock Co., Newport News, Va., presented a paper on welded machinery foundations for ships which gave in considerable detail the results of experience and practice of his company. Foundations of the welded type have many advantages, according to Mr. Moore. They effect a saving in weight, eliminate connecting angles and are usually less expensive. James W. Owens, Welding Engineering & Research Corp., New York, said that the use of welded construction in foundations for auxiliary equipment on shipboard offered to designers the great advantage of not having to complete plans for such auxiliaries at the time the main fabricating contracts were made. Work on the main structure of the ship, he said, could continue to completion and the location of the auxiliaries could then be determined as it was easy to weld these in place at such points as might be determined. Often the design of auxiliary equipment is changed after the first plans have been completed and with riveted construction this may mean considerable alteration.

Others to discuss this paper were C. W. Bryan of the Federal Shipbuilding & Dry Dock Corp., Kearny, N. J.; L. C. Bibber, United States Navy, Washington; F. T. Llewellyn United States Steel Corp., New York; and Capt. Hermann Lottman, in charge of construction at the Wilhelmshaven navy yard, Germany.

Capt. Lottman gave a description of the extensive welding in ship construction in Germany today. He said that at his yards they found welding construction reduced the cost of ships by about three per cent and that it reduced the weight in some cases as much as 12 per cent. He said, "In Germany we will never go back to riveted construction." At the navy yard at Wilhelmshaven 12 welded destroyers and three cruisers are nearing completion and nearly 200 arc welders and many gas welders are at work.

Welded boilers for United States navy scout cruisers were described in a paper presented by J. C. Hodge Babcock & Wilcox Co., Barberton, O.

The fact that the navy has accepted specifications covering welded boilers is an outstanding development for heretofore the navy has been reluctant to give its stamp of approval on the welding of many less vital factors in connection with its ships. Credit for this acceptance, according to Mr. Hodge, must be given chiefly to the nature of the specifications and tests. The specifications were summarized in a table in the paper and covered thermo stress relieving tension test, bending test, a sharp impact test, a minimum specific gravity of welded metal of 7.80, a chemical analysis covering manganese, phosphorus, sulphur, carbon and nitrogen (as iron nitride), macroscopic and microscopic examinations, a hydraulic test to twice the working pressure and an X-ray examination of joints. This last item is one of the important features and according to discussion of the paper it was probably this one item more than anything else which caused the navy department to permit welding construction. Twenty-four boilers were supplied and 23 passed the X-ray test. A defect was indicated in the twenty-fourth and it had to be rebuilt.

C. W. Obert, Union Carbide & Carbon Co., New York, who presided at the shipbuilding session said that the important and encouraging thing in the boiler construction for the scout cruisers was the fact that specifications have been so carefully worked out that the navy without hesitation has accepted them and put its stamp of approval on work produced in conformity to them. Dr. Ancel St. John, St. John X-ray Service Corp., New York, in discussing the question of X-ray testing said that it was common practice to detect a defect of 2 per cent of the thickness of the shell by this means. He said they found defects as small as 1/16 inch in 2¼ and even 3 inch plates. Mr. Owens said that the use of the X-ray or some other form of nondestructive test was undoubtedly invaluable at the present time in the construction and acceptance of large heavy duty boilers. He said that the boiler code allows the use of higher stresses in the design of joints that are X-rayed, and that this alone would go a long way toward paying the expense of examination. He spoke of the gamma ray and magnetic tests as worthy of consideration.

Mr. Scott, bureau of engineering, United States Navy, asked for further details in the actual welding procedure on the boilers constructed for the cruisers and Mr. Obert replied that the boiler code committee had

first tried to specify these details but found that this often conflicted with priority rights or with methods which were more or less secret, and that this first plan had been entirely abandoned in favor of one specifying results only.

New Radiobeacon Chart

A new radiobeacon chart, showing at a glance the location of every radiobeacon on the Atlantic and Gulf coasts, giving the sending period of each station and its distinguishing characteristic, has been prepared by the lighthouse service of the department of commerce, and is now ready for distribution. Such charts are intended for posting in the pilot houses of vessels using radiocompasses in navigation.

Record of Europa and Bremen in Years of Operation

The North German Lloyd express liner *EUROPA* completed her first year of service March 25. During this year she made 17 round voyages. On her maiden voyage she broke the westbound transatlantic record by making the crossing in 4 days, 17 hours and 6 minutes at a speed of 27.91 knots. During the year's operation the *EUROPA* maintained an average speed of 25.98 knots. During her first year of service the *EUROPA* carried 44,383 passengers and covered 127,000 miles on her 17 transatlantic round voyages. On each trip to Europe she carried an average 1455 passengers and on the westbound voyage she carried an average of 1478 passengers. Of the total passengers carried during the year, 22,343 were carried westbound and 22,040 eastbound.

The *BREMEN* on her maiden voyage in July 1929 established a new record of 4 days, 17 hours and 42 minutes. She bettered her sailing in October 1929 when she crossed in 4 days, 17 hours and 24 minutes, at an average speed of 27.20 knots. This record was again lowered by the *BREMEN* when she made the passage from Cherbourg to Ambrose lightship in October 1930 in 4 days, 17 hours and 18 minutes. During the two years the *BREMEN* has been in service, she has made 32 transatlantic round trips.

In 1929 beginning July 27 the *BREMEN* made seven trips eastbound, carrying a total of 11,354 passengers. Westbound during 1929 beginning July 22 she made seven trips, totaling 13,606 passengers. In 1930 she made 17 eastbound trips and carried a total of 23,608 passengers. Westbound for this year she made 18 trips carrying 26,151 passengers. In 1931 eastbound up to May 13, the *BREMEN* made eight trips carrying 8064 passengers. During this year up to May 10, she has made seven westbound trips and has carried 5209 passengers.

Stokers Installed in Modern River Towboats

TWO modern river towboats, the HENRY A. LAUGHLIN and the VESTA, were recently launched from the Charles Ward Engineering Works at Charleston, W. Va. These two boats were built for the Vesta Coal Co., a subsidiary of the Jones & Laughlin Steel Corp. The accompanying illustration shows the HENRY A. LAUGHLIN towing six barges loaded with coal.

These two boats are sister vessels and are identical in dimensions and layout. They are 160 feet long; 29 feet 6 inches beam, and 8 feet 9 inches depth. They are propelled by twin screws driven by two 350-horsepower engines, built by the American Ship Building Co., Cleveland. Coal is used as fuel and steam is supplied by a Babcock & Wilcox watertube boiler designed for 300 pounds working pressure. One of the most interesting features of these boats is the stoker which was built and installed by the Standard Stoker Co. Inc. This stoker is the result of many years of development and embodies the latest features for steamboat requirements. The applications of this stoker on the HENRY A. LAUGHLIN and the VESTA are identical.

The boiler is equipped with two fire doors. The stoker enters at the front center of ashpan and the vertical conduit rises up above the grate level just inside the fire wall. The vertical conduit is protected by a drilled type protecting grate which also admits the required overdraft for correct combustion. Just above the grates and resting on the vertical top is the firing table which acts as a receiver for the fuel as it rises through the vertical overflow at the top. The distributor with the required number of jet holes and controlled by five separate valves is set centrally at the rear of the vertical and just above the firing table level. This allows the fuel to be caught in the jet of steam where it is readily spread.

The distributor is cast integral with the manifold into which a steam pipe enters. This manifold, having five separate cores is supplied with five valves which regulate the supply of steam through the jet holes. The manifold is located in a convenient place on the outside front head with a gage supplied on the steam line which registers the exact steam pressure being used for fuel distribution. At the lower end of the vertical tube is the elbow section to which it is attached, bringing the conveying housing back in a horizontal position toward the coal bunkers. The section which enters the coal space is shaped like a trough and supplied with sliding cov-

ers, which when open, permit the fuel to drop into the conveyor.

At the rear of this conveyor trough is a housing which encloses the screw drive gears of the stoker conveyor. The main drive shaft extends into the trough to permit a coupling with the conveyor screw. The conveyor screw itself, when properly coupled together, makes one continuous screw which carries the coal forward with little resistance. At the forward end of the conveyor trough there is a pronged structure against which the coal is broken down to proper firing size. At a point just to the rear of the vertical conduit centerline the conveyor screw is designed to push the fuel evenly through the vertical conduit and on the firing table.

The two boats are provided with a right side drive shaft, that is, the stoker engine is placed at the right forward end of the conveyor trough. In other arrangements the stoker engine may be placed at the left side or at the extreme rear of the trough, directly connected with the pinion gear and eliminating the drive shafts extending from the rear housing to the engine.

The stoker engine has two cylinders 7 inches bore by 7 inches stroke with valve motion effected by single eccentric. The engine is reversed by means of a valve into which the steam and exhaust lines enter. This is accomplished by a movement of the spool valve in the valve body which changes the course of the steam and exhaust. This valve is for use in emergency and offers a means of placing the stoker engine in neutral position if desired.

On the two boats, fuel is normally conveyed a distance of about 12 feet and the conveyor is arranged to bring the fuel forward at a greater distance. It is said that this stoker, through the even distribution of fuel, produced

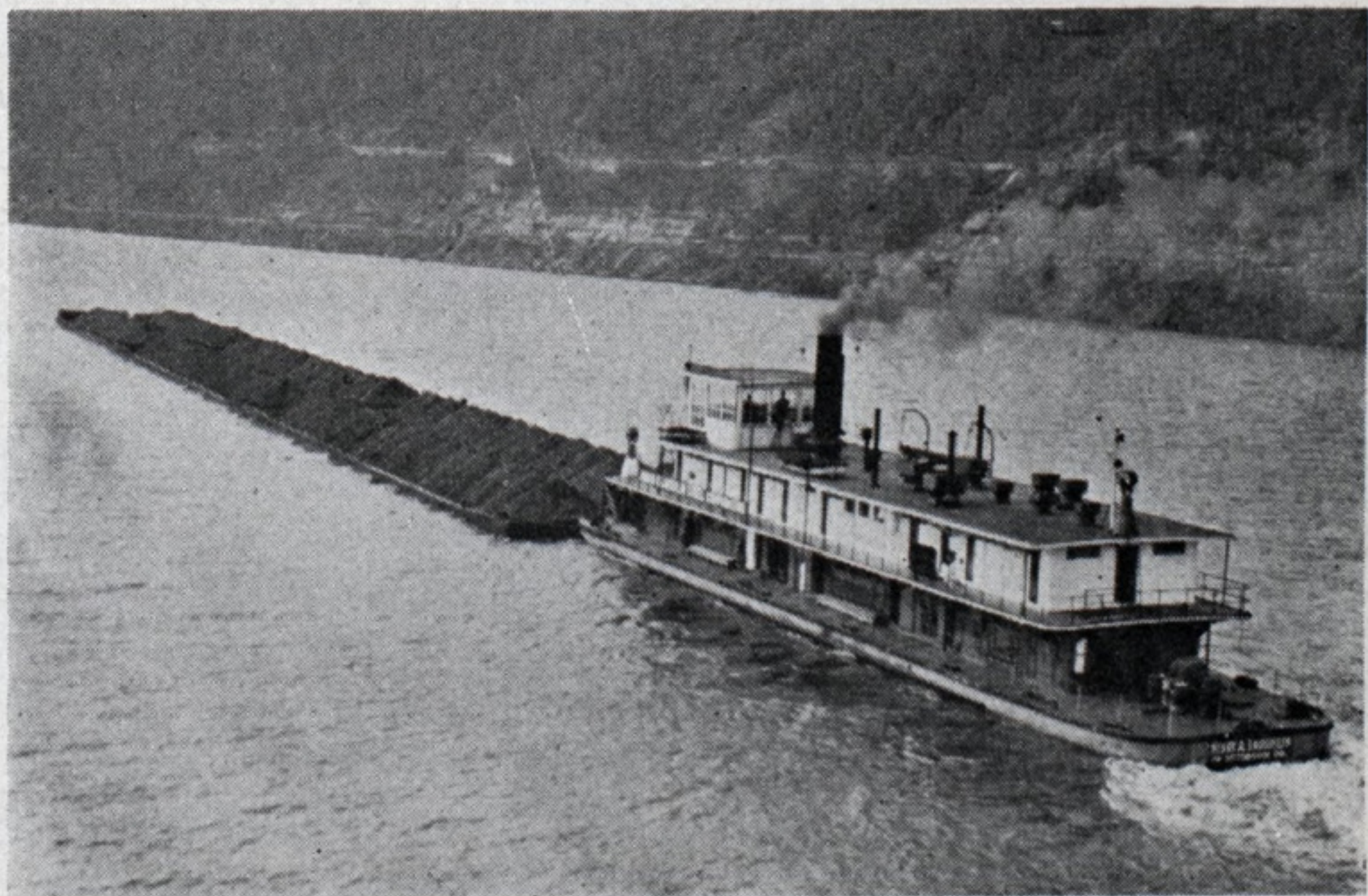
temperatures of approximately 2600 degrees.

When these stokers were placed in service a device was installed which started the draft fan, steam jet supply and the stoker engine at a predetermined boiler steam pressure. This device also automatically stopped the stoker conveying fuel when maximum pressure was obtained. With this arrangement, it is claimed that the stoker was stopped and started on a fluctuation of approximately five to seven pounds pressure, and that when the boat was tied up and steam consumption was reduced to the use of auxiliary equipment only, the stoker worked automatically.

Finance Board of New Ship Line is Formed

Organization of the finance committee of the proposed Philadelphia Mail Steamship Co. was announced in Philadelphia on June 14. The company proposes to establish a combination passenger and cargo service between Philadelphia, Liverpool and Manchester. Members of the finance and organization committee will include J. N. Pew, president, Sun Oil Co.; Harold Loeb, chairman, Tradesmen's National Bank & Trust Co.; Harvey C. Miller, president, Southern Steamship Co. and Atlantic Tidewater Terminals; Charles H. Ewing, vice president, Reading Co.; J. S. W. Holton, president, Philadelphia Maritime exchange; Nathan Hayward, president, American Dredging Co.; Philip H. Gadsden, vice president, United Gas Improvement Co. and president of the Chamber of Commerce; J. W. Van Dyke, president, Atlantic Refining Co.; A. Atwater Kent, president, Atwater Kent Radio Mfg. Co.; Alfred J. Ball, general foreign freight agent, Pennsylvania railroad; Hubert J. Horan and John J. Egan, secretary to the committees. It is expected the company will be formally incorporated in the immediate future and will then take steps to raise the \$4,000,000 fund to supplement the contributions of the Pennsylvania, Baltimore & Ohio and Reading companies.

Towboat Henry A. Laughlin recently launched at Charles Ward Engineering Works for Vesta Coal Co.

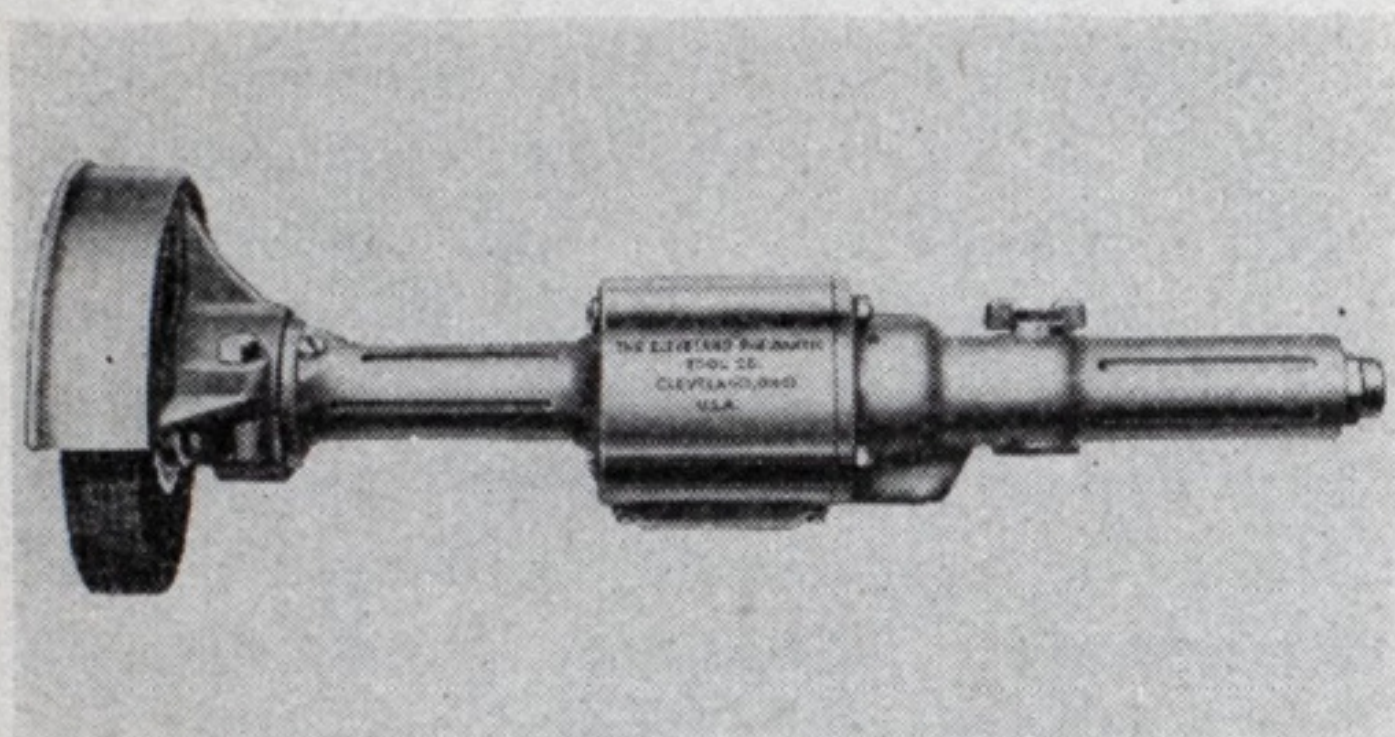


Equipment Used Afloat and Ashore

Rotary Air Grinder—Tensionmeter—Airplane Hoist Control—Oil Ring Type Marine Bearings—Portable Crane—Dustless Sander—Electrolysis Eliminator—Marine Signal Device

A NEW type of portable rotary air grinder, produced by the Cleveland Pneumatic Tool Co., Cleveland, is shown below. This grinder is made in several sizes and may be used for any general grinding where a portable tool can be used to advantage.

The new Cleco rotary grinder has a single rotor which is concentric with the arbor, insuring a perfect balance at all speeds. The rotor is provided with four longitudinal



New Type Portable Air Grinder

slots to accommodate four separate blades which are in turn forced outward to the wall of a stationary cylinder which is set eccentric to the axis of the rotor. As one blade of the set is always exposed to the air current a constant rotation is established. The arbor to which the rotor unit is attached is rigid and made of selected steel. The governor is a detachable unit and when in operation controls and governs the amount of compressed air used. An oil reservoir in the rear end of the grinder body, is filled with oil automatically delivered to the rotor, the flow of lubrication being controlled by the governor.

Ease and Accuracy Mark Use of Tensionmeter

THE tensionmeter shown in the accompanying illustration quickly and accurately gives the tension on wires, cables and lines. Its heavy aluminum case and all exposed parts are chrom-

ium plated or made of stainless steel. It weighs 14 pounds and measures two and one-half feet overall. The standard model will test all wires and ropes up to one inch in diameter and has a tension capacity of 16,000 pounds. Larger capacity meters and meters for special shaped cables are also available. Hills-McCanna Co., 2551 Nelson street, Chicago, are the manufacturers.

Docks and ship riggers use the tensionmeter for measuring cable tensions and for weighing. Equalizing the load on multiple cables is another important use for the instrument. This instrument replaces the dynamometer and provides a more accurate device for testing wires and cables without cutting or marring.

For operation, the tensionmeter is simply hooked on to the wire in any position and the center bearing tightened, which deflects the cable. A correct reading is given at once. The whole operation takes less than a minute. The reading is taken directly from the scale in pounds; there are no calculations or temperature corrections to make. There are no liquids, glass or loose parts to cause trouble. No wrenches or tools are required in its operation, enabling workmen, dressed for severe cold weather, to use the meter without trouble.

Airplane Hoist Control On U. S. S. Pennsylvania

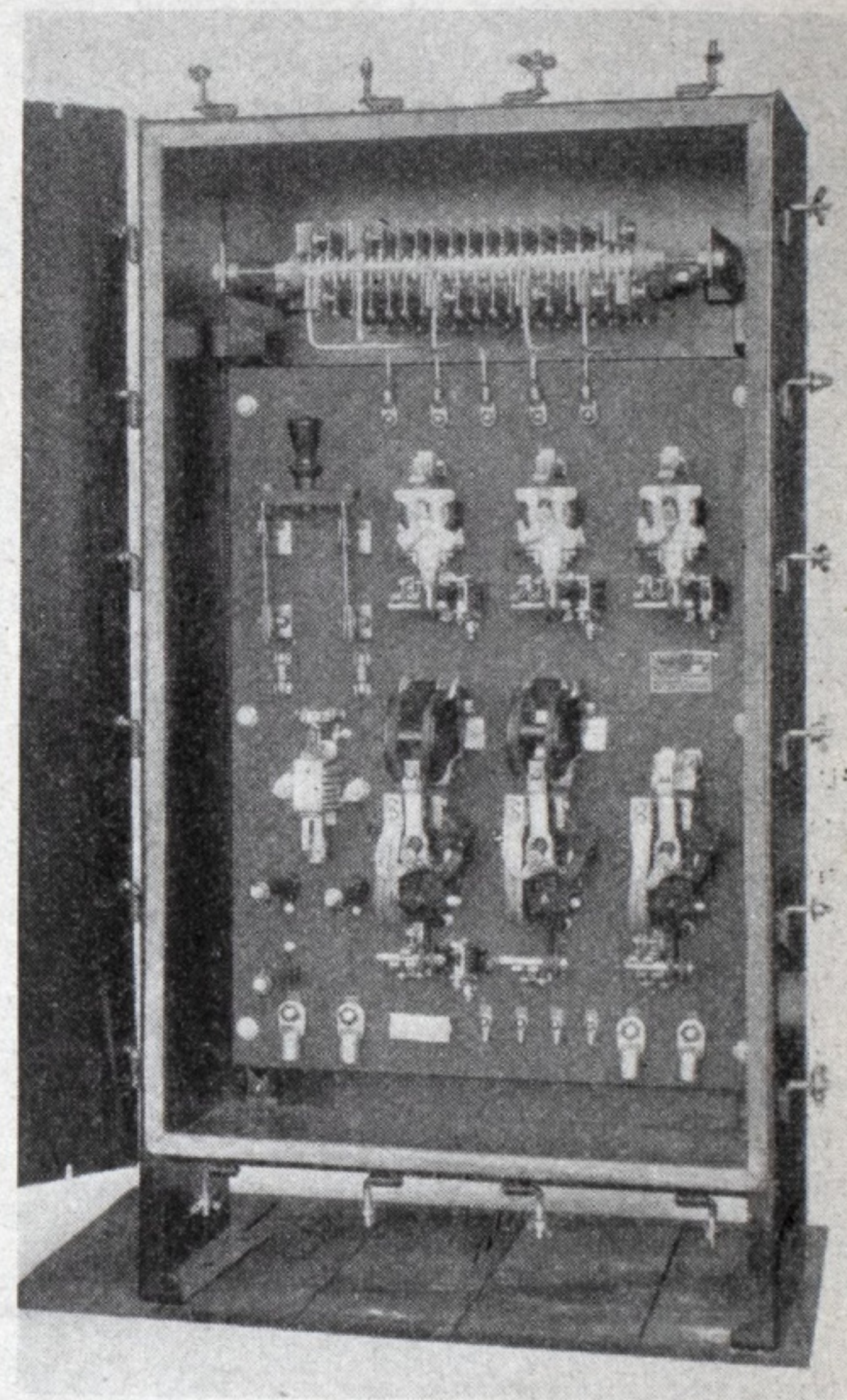
A NEW and interesting application of shipboard installations on naval vessels is that for handling airplanes through motor driven hydraulically operated speed gears. For such an application, the motor, which is usually of the constant speed, shunt wound type, requires a suitable starting equipment. As the complete electrical equipment is installed in an exposed location, the motors and controllers are of the waterproof type.

A typical installation is that recently effected on the battleship PENNSYLVANIA and the control for this application is shown in the accompanying

halftone illustration which appears below.

This design of controller is used with a 35 horsepower 115 volt D. C. constant speed motor.

The panel is constructed of asbestos lumber with a sub-panel supporting the necessary resistance units located for easy access. On the main panel are mounted a double pole, unfused line knife switch, an adjustable overload



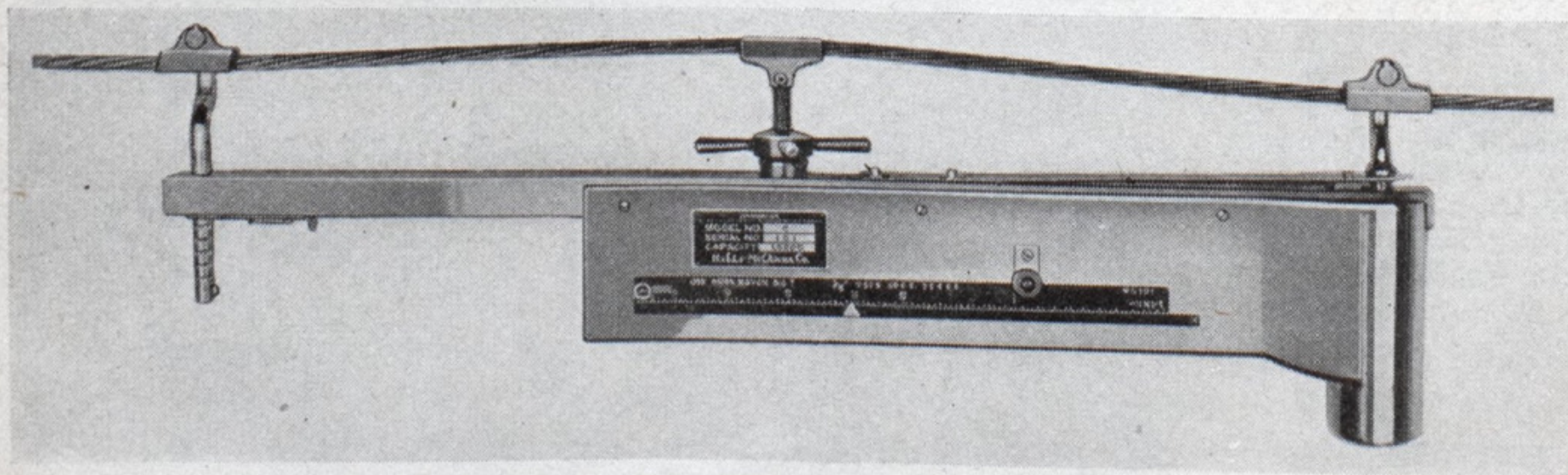
Airplane Hoist Control

relay, two line contactor switches series relay type accelerating contactors, navy test link and necessary terminals.

Operation is obtained from a remote 3 wire control waterproof pushbutton station, the controller being designed for low voltage protection. The controller conforms to United States navy requirements for class A shock, and the contactors, relays, etc., are so designed as to be not effected by pitch or roll of the vessel up to an angle of 45 degrees from normal. All parts liable to corrosion due to salt atmosphere are suitably protected by zinc plating or sherardizing. Cutler-Hammer, Inc., Milwaukee, are the manufacturers.

Oil Ring Type Marine Bearings Perfected

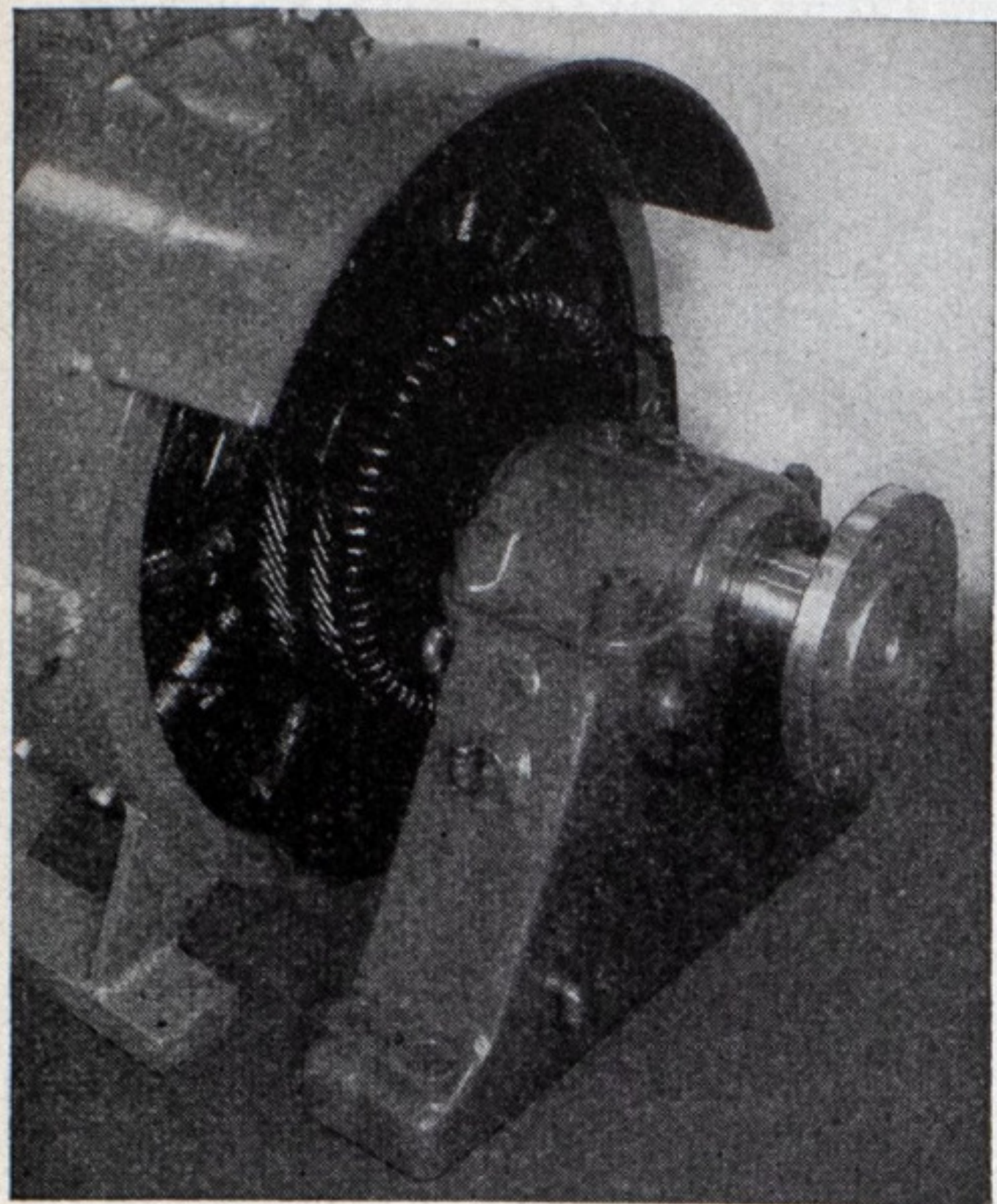
RECENTLY a new type of bearing for marine service has been developed by the Westinghouse Elec. & Mfg. Co., East Pittsburgh, which re-



Hills-McCanna Tensionmeter Shown in Operation

tains the advantages of the oil ring type of lubrication and is completely adaptable for marine applications.

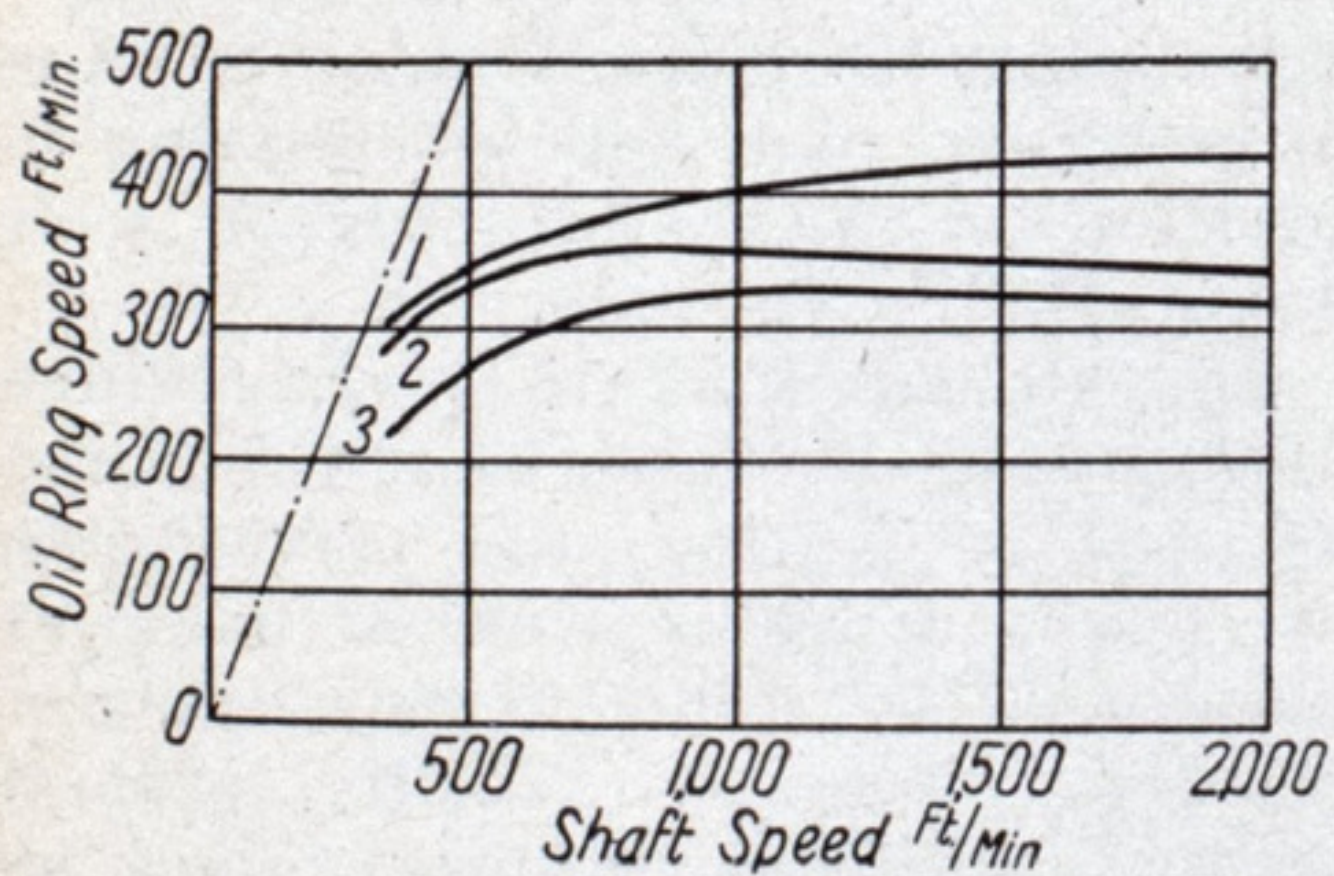
Advantages of the type QS bearings may be classified as operational and dimensional. Continuity of oil ring



Oil Ring Type Marine Bearing Designed for 10 Degree Tilt Fore and Aft and 15 Degree Roll

rotation under extreme conditions of tilt is obtained by a special construction of brass guide fingers on the walls of each ring chamber. The guide fingers limit the ring contact surface and the frictional torque tending to stop the ring and act satisfactorily as ring guides and oil wipers. Ring operation under tilt conditions is maintained by a decrease in the oil film between it and the bearing shaft, as the ring tends to ride on its outer edge in the tilt position. The decreased oil film increases friction between the rotating shaft and ring, which results in an actual increase in the speed of the ring.

An outstanding advantage of the type



Curves Showing Oil Ring Speed Plotted Against Shaft Speed in Feet Per Minute for (1) No Roll, No Tilt, (2) No Roll, 10 Degree Tilt, and (3) 15 Degree Roll, 10 Degree Tilt

QS bearing is the constancy of speed of ring rotation, and of oil delivery, independent of shaft speed. Ideal conditions of lubrication have been obtained with the securing of an adequate oil supply at low speeds, and in the elimination of excessive amounts of oil and leakage at high speeds. A section of the ring and its

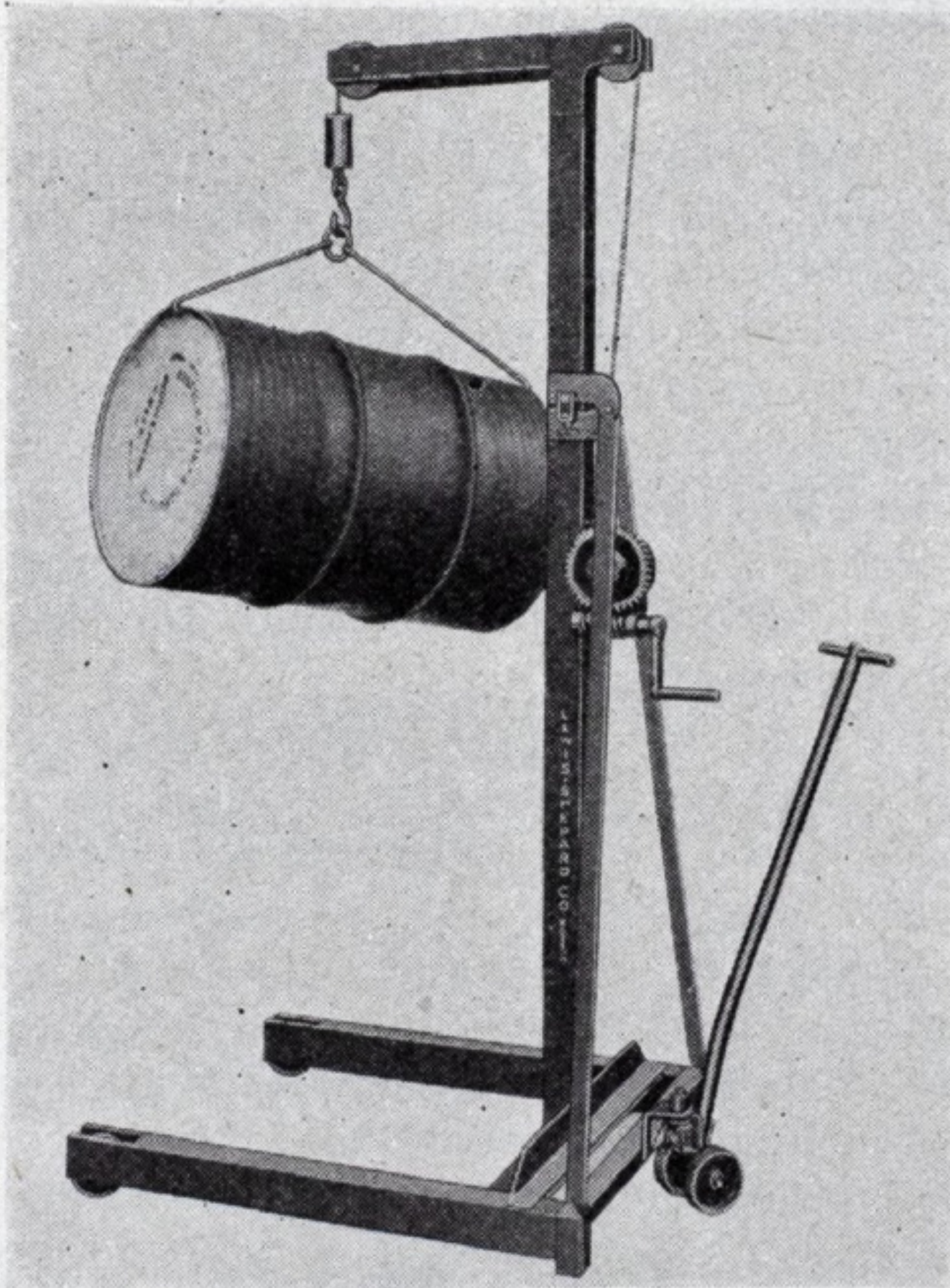
characteristic curves are shown in the accompanying illustrations.

The QS bearing delivers about twice the quantity of oil as the conventional ring type bearing. The usual safeguards against leakage of oil ring bearings are incorporated.

A substantial reduction in space requirements is afforded as the new bearing is smaller in both length and diameter than the disc type.

Portable Cranes Useful in Cargo Handling

ONE of the four new types of portable cranes recently put out by the Lewis-Shepard Co., Boston, is shown below and is known as the hinged type, both the boom and the main upright being hinged. The advantage of this type of crane is that it can be taken through practically any doorway and yet can be used to the full height of the ceiling. The other types of cranes are the telescopic, revolving hinged and revolving telescopic. All machines can be furnished with a hand worm drive winch, a hand spur drive winch and an electric drive winch. Air motor and gas engine can also be utilized



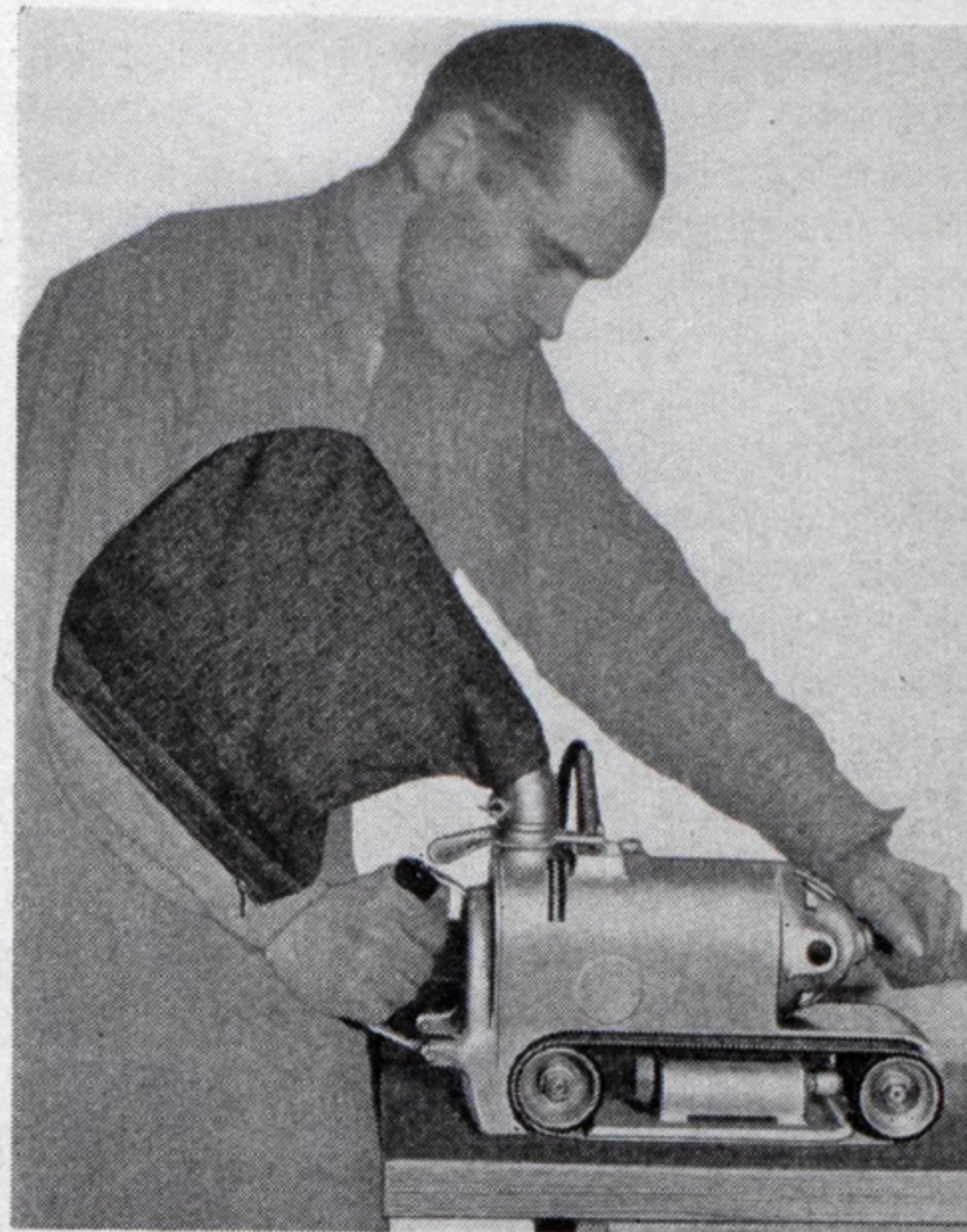
Hinged Type of Lewis-Shepard Standard Portable Crane

where conditions require. Heights of the cranes vary from six to 14 feet and capacities from 500 to 2000 pounds.

New Machine Has Built-In Dust Removal System

A UNIQUE feature in the new model dustless take-about sander recently brought out by the Porter-Cable-Hutchinson Corp., Syracuse, N. Y., known as Type B-10, is the dust removal system which has

been built into the machine. A double blade fan traveling at 10,000 revolutions per minute creates a powerful vacuum which draws the dust through ports directly in back of the



Type B-10 Dustless Take-About Sander Recently Brought Out by the Porter-Cable-Hutchinson Corp., Syracuse, N. Y.

rear pulley and deposits the dust in the bag. Dust is easily removed from the bag through the zipper opening and the bag is easily detached from the machine. This dust collecting feature keeps the air clean and prevents excessive clogging of the abrasive belt which means faster cutting, as the grit remains sharper, and longer belt life is the natural result.

As can be seen from the illustration, the motor is laid horizontal to the frame of the machine, giving the machine perfect balance with consequent easy handling. The weight of the machine being concentrated over the sanding shoe has a tendency to increase the actual cutting speed without applying any additional hand pressure. The motor is of the universal type, developing a trifle over 1 horsepower. Armature can be removed without disturbing the field. Gears can be removed without disturbing the motor. Eleven ball-bearings are used which should keep repairs to a minimum. The switch is a 10 ampere double pole type housed in Bakelite case and is located in top of the frame.

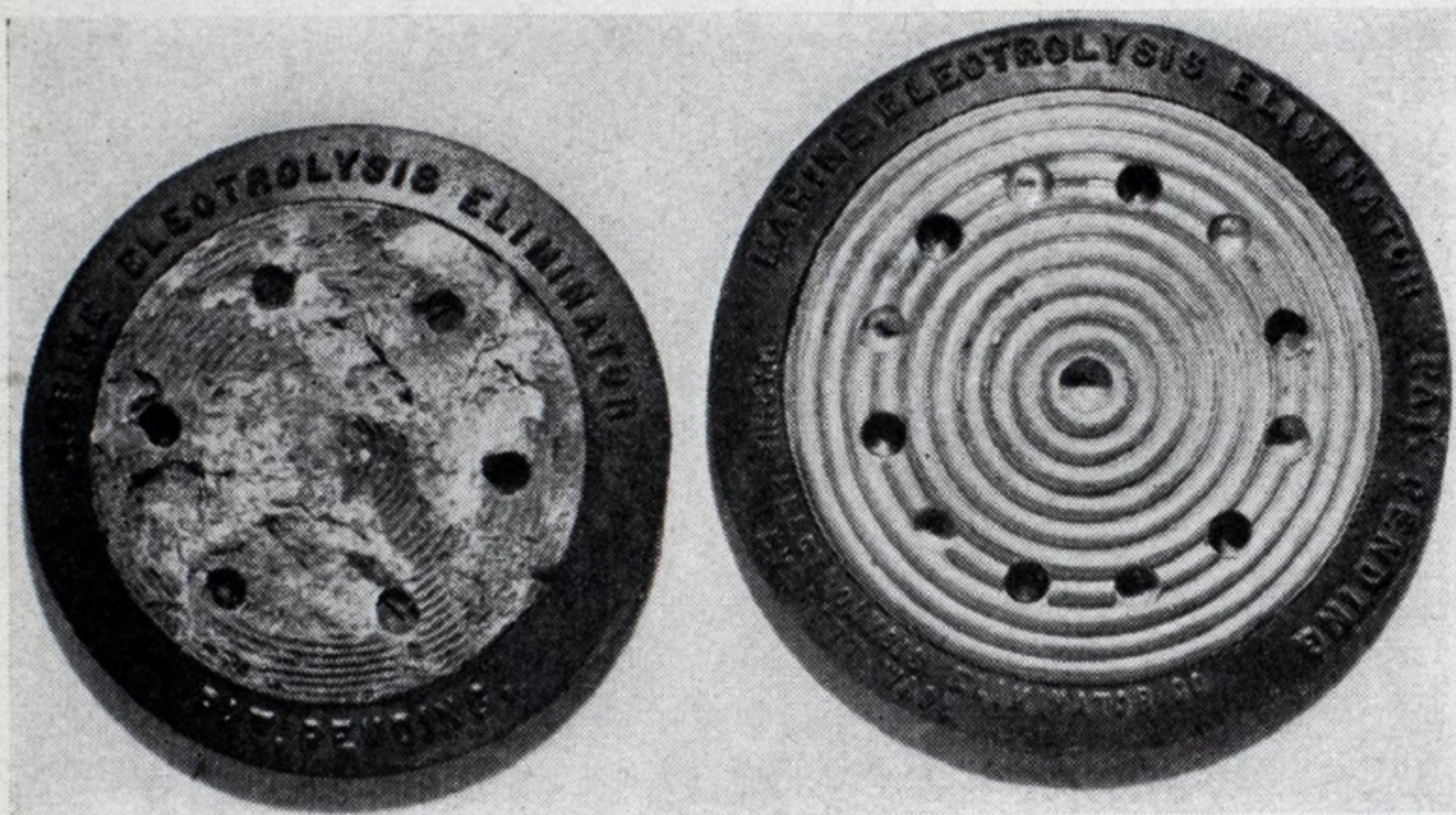
This machine is also equipped with a new type of sanding shoe over which the belt passes. Belts can be changed in a few seconds and can be supplied in any grit or degree of fineness.

The use of the dustless take-about sander is not limited to wood only. The abrasive actually does the work and this tool is merely a means by which the abrasive is put to work. Therefore, using the correct abrasive belt, almost any material, either flat or curved, can be surfaced.

Correct Electrolysis By Use of New Device

AN ELECTROLYSIS eliminator which its manufacturers claim ends for all reasonable time the present "cancer of electrolysis which is eating away stern bearings, propellers and propeller shafts, rudders and shoes, is now marketed on the Pacific coast by the Marine Electrolysis Eliminator Co., Seattle, after two years of demonstration on nearly 100 Puget Sound ships.

The device, which is slightly concave and circular in shape, comes in three sizes, and is usually attached in pairs to the bottom of the ship, with a copper-wire hook-up to the engine and water circulation system, also to the stern bearing and stuffing box on the



Marine Electrolysis Eliminator, Showing Core After use and New Eliminator

propeller shaft. It is claimed the cause of the many trips to the dry-dock made by salt-water craft now is the fact that the circulating water system, with its brass and iron piping and salt water for an electrode, constitutes a perfect galvanic battery. No effort is made to alter this fact, but the current's flow is reversed ingeniously.

With the eliminator installed, a removable core or electrode is the only article eaten away, the flow of formerly destructive current is reversed and now electroplates and improves bearings it formerly gnawed away. "Cures" of cancerous electrolysis that ate out stern-bearings as high as eight times in four months have now been judged permanent, after a year's operation and a dry-dock examination that proved no repairs to be necessary.

An example of the action of electrolysis on the movable core of a marine electrolysis eliminator is shown in the accompanying illustration. On the left is the core taken as a specimen from a Puget Sound vessel after nine months' use, when 20 per cent of the metal had been eaten away. On the right is shown a new eliminator for comparison only.

Tests of Marine Signal Device Proves Success

A DEMONSTRATION of a new aerial marine flare signalling device was held on the evening

of May 28 for the benefit of the members of the executive committee of the marine section, National Safety council. The coast guard cutters RELIANCE and CUYAHOGA carried the party out to Ambrose light-ship, New York harbor, from which point the two ships sailed a diverging course that separated them a mile every six minutes. The signals were fired at intervals of a mile until the limit of the 15-mile course had been reached and the demonstration was declared a complete success.

These signals are suspended from a parachute and ascend to a height of 250 feet, the lights being visible at a distance of 25 miles. The system has been approved by the United States steamboat inspection service and adopted by the coast guard as a part

of their regular equipment. The red signals are of 30,000 candlepower intensity and the white signals are of 50,000, the average duration of burning being 35 seconds. The signals are shot from a hand pistol constructed of brass and rust-proof steel weighing approximately four pounds and are especially designed for lifeboat use and ship signalling.

In addition to the signal being an aerial flare, it can also be used as a hand torch. The equipment provides a light hand holder for the signal and a supply of scratchers for manual ignition. The International Flare-Signal Co., Tippecanoe City, O., is the manufacturer of the new device.

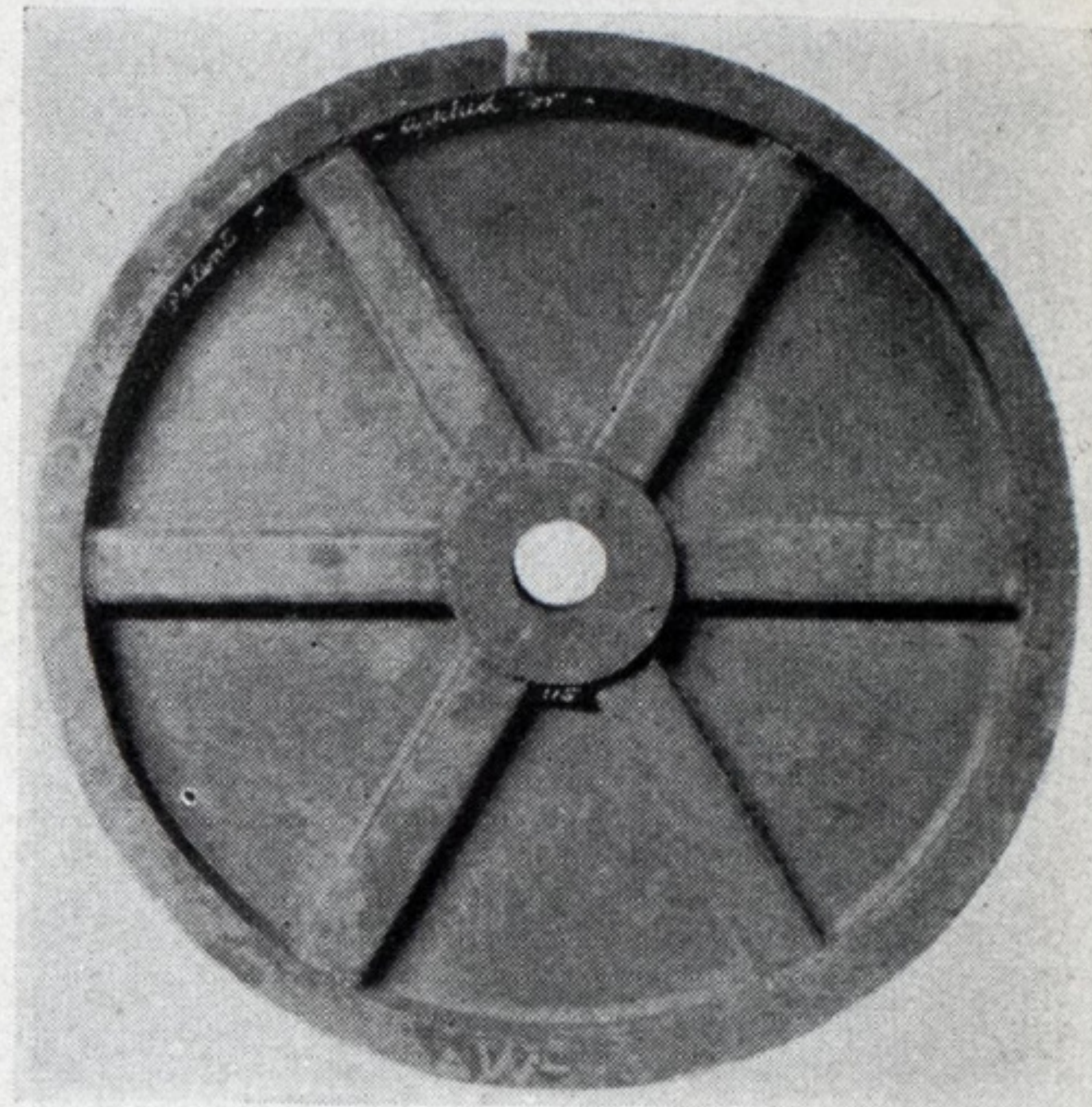
A New Prime Mover

AT THE meeting of the Royal Society of Arts in London, June 4, a paper was presented by J. F. J. Malone on a new prime mover, the thermal dynamic medium of which is a liquid.

While this new engine is similar in some features to the hot air engine, it differs in the fact that the medium is a liquid. Features claimed for the new engine are the small quantity of medium required; its freedom from wastage; its long thermal range; its ability to give good efficiency on cheap fuels; its freedom from explosive hazards; silence and elasticity. Water has been selected as the best thermodynamic medium.

New All-Welded Rolled Steel Gear Blank

THE all-welded rolled steel gear blank shown in the accompanying illustration is made for use in the manufacture of cut gears, either spur, herringbone or helical, and can be



Arc Welded Rolled Steel Gear Blank

made any size from 24 inches outside diameter up. The largest blank made up to the present time is one with a shipping weight of 4350 pounds, of 66 3/4 inches outside diameter, 11 3/4 inches width of face, 4 1/8 inches thickness of rim, and 22 1/2 inches diameter hub. While these blanks are ordinarily made entirely from S. A. E. 1020 carbon steel, the rims can be furnished in steels of special analyses if desired.

The hubs of the all-welded gear blanks are first gas-cut from solid rolled steel to give the desired hub diameters. The webs are gas-cut from rolled steel plate, as are the ribs, the latter being formed into channels of the required section. The webs are arc welded to the hubs, and the reinforcing channels are welded to the web structures. The final operation consists of the circular bending of the gear ring, and arc-welding in position to form the finished gear blank.

In the manufacture of all-welded gear blanks, no patterns are required as the gas-cutting and arc-welding are done with blueprints of the gear designs as the guide. This eliminates pattern cost and permits prompt manufacture and shipment, since no time is required for pattern-making.

The major advantages of the all-welded gear blank are the purity and homogeneity of the thoroughly-annealed rolled steel from which the gear blanks are made. The gear rings can be uniformly cut, and the cut teeth are sound in structure. Lukenweld, Inc., Coatesville, Pa., are the manufacturers.

On June 1 the Atlanta, Ga., sales office of Cutler-Hammer Inc. was moved to 133 Cone street N. W. on the street floor.

Test Giant Gate Lifter for New Welland Canal

THE official tests of the mammoth lock gate lifter of 500 tons capacity, capable of lifting the largest gate-leaf used in the new canal, were started on May 15, 1931, in the presence of the Welland canal officials and representatives of the builders, the Collingwood Shipyards, Ltd., the Canadian Westinghouse Co. and the Canadian Allis-Chalmers Co., and also the Wellman Engineering Co., Cleveland, from whose specifications and plans, this unique piece of equipment was built.

Tests prescribed by the canal engineers for ascertaining the stability of the floating mass, power consumption, reliability and control of power and movable water ballast, were performed, easily meeting the specifications in every particular.

Two spare gate leaves were used in the tests so far conducted. The first gate—35 feet 6 inches high weighing 180 tons, and the second 44 feet 6 inches high weighing 230 tons, each gate being taken from a floating position and hoisted until the lifting eyes in the top of the gate were 56 feet above the water level.

Numerous stops were made on the first trip, or lift, to shift the water ballast for the purpose of maintaining zero list and trim and also for recording the amount of water in each of the

in actual future service at the canal.

It was demonstrated that the ballast pumps have ample capacity to maintain zero list and trim without stopping the hoist motion, or lowering motion, when handling either the 180 or 230-ton gates.

The slewing motion of the 25-ton auxiliary derrick was also tested and a record of the water ballast required was made with the load at 30 feet and 70 feet radius and 30 degrees either side of center which is the specified limit of slew and 95 feet radius on the center line which is the maximum reach.

During all the tests there was an absence of smoke and exhaust steam which would obscure clear vision of the operator, and each and every piece of apparatus and control equipment functioned as intended without difficulty.

It is planned to make the final tests in the handling of the largest gates which are 82 feet 0 inches high, 45 feet wide and of approximately 500 tons weight each, in the near future.

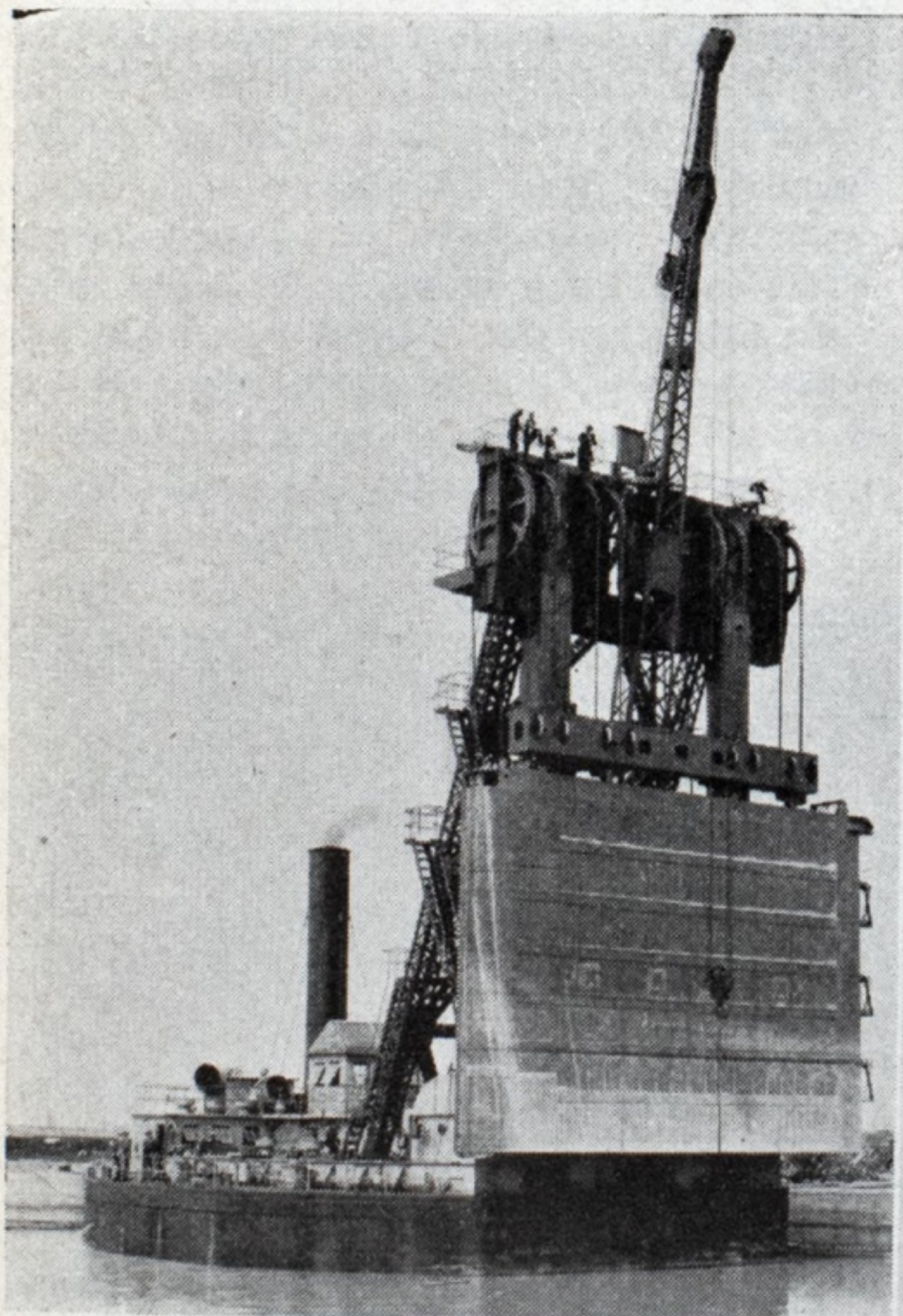
The accompanying views were taken during the tests. A description of this gate lifter was published in the MARINE REVIEW issue of November, 1930, pages 65-66.

Houston Adds New Shed to Its Port Equipment

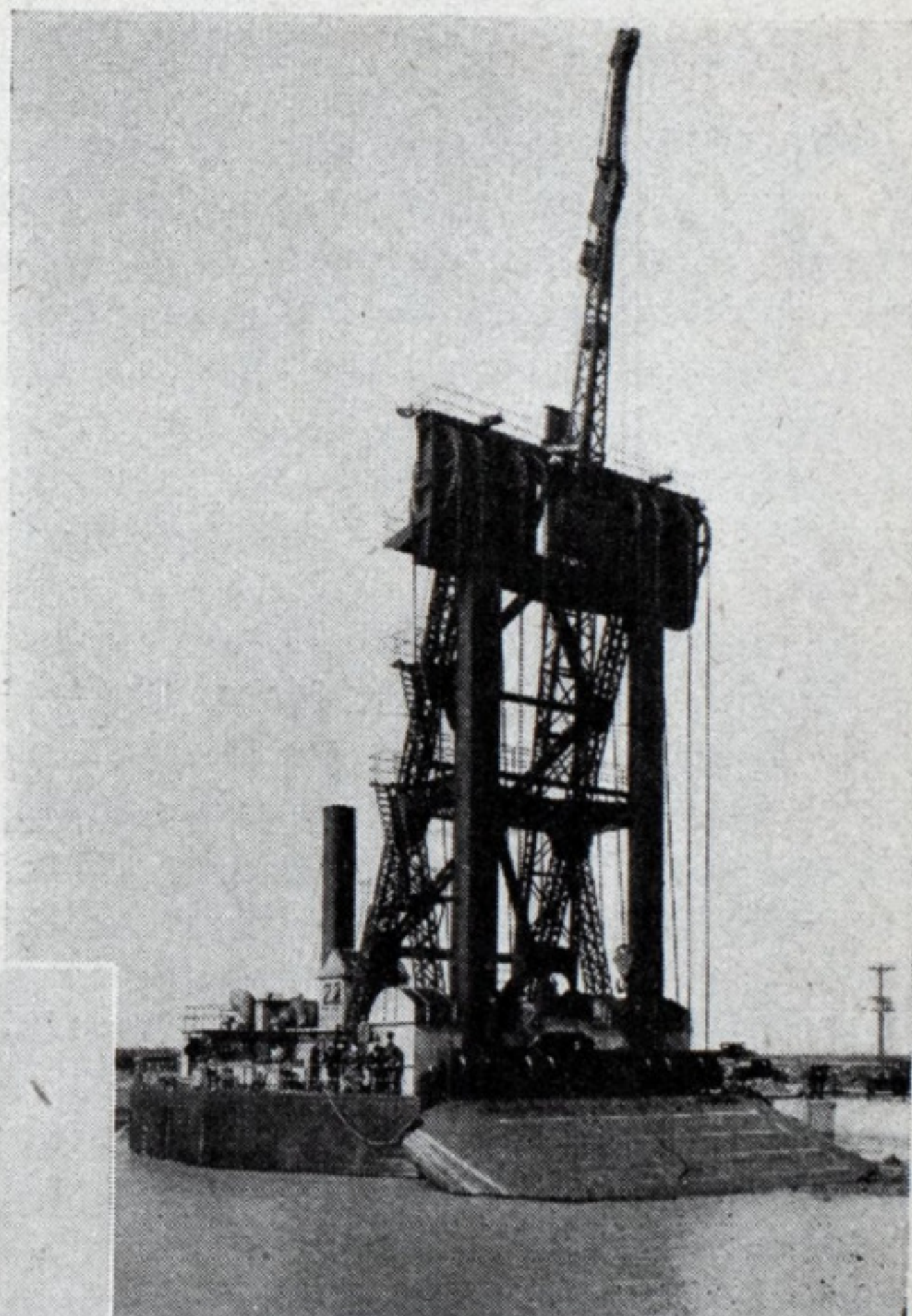
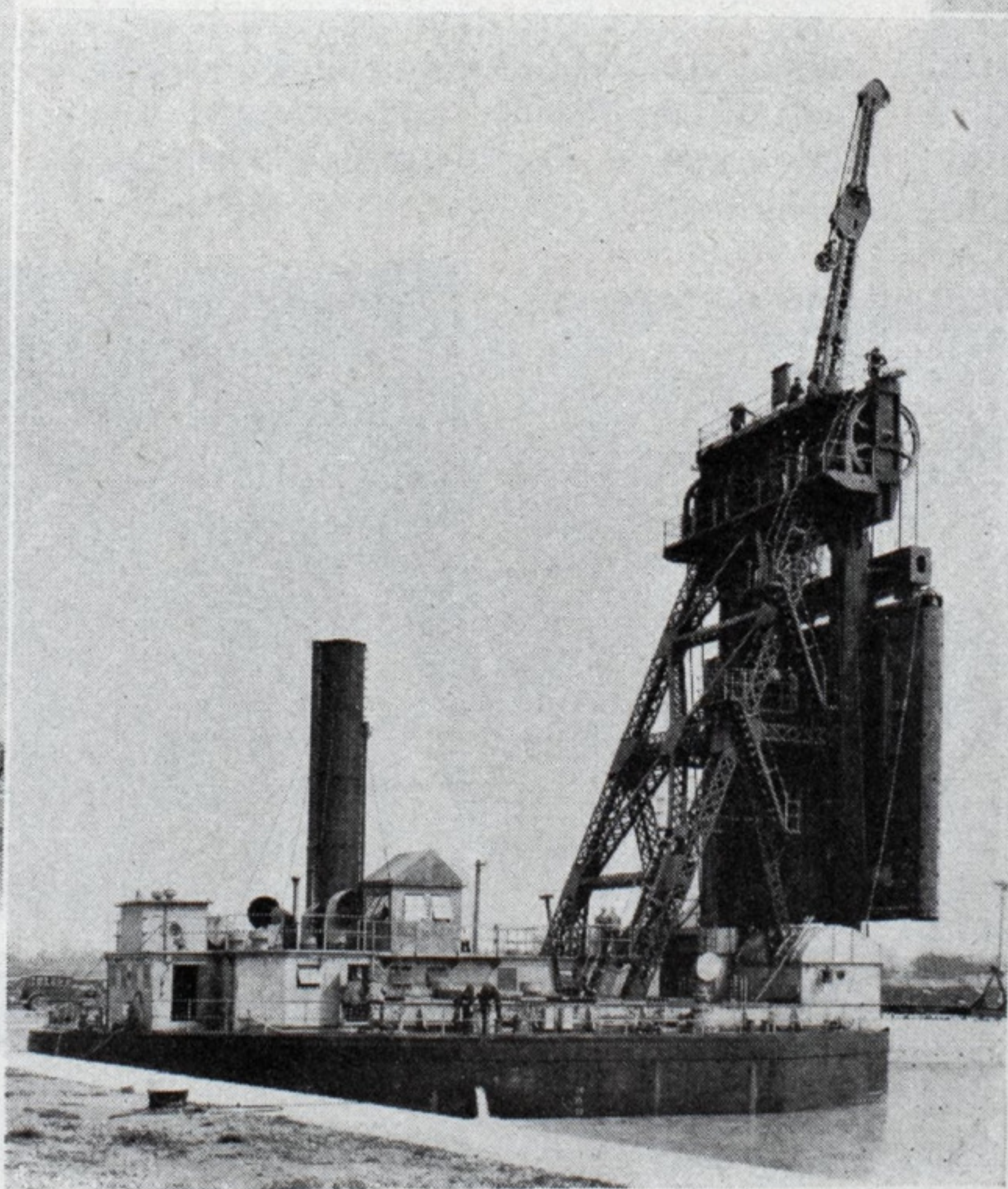
The Navigation commission, governing body of Port Houston, Texas, will construct a modern steel shed behind

concrete wharf No. 10 on the north side of the turning basin. The shed will be 125 feet wide and 580 feet long with clearance of 14 feet under the trusses. The structure will be supported on a reinforced concrete dock. The shed will be equipped on each end with a road arrangement permitting trucks to have access at all times, regardless of the switching conditions at the plant, and in addition to the roadways the depressed tracks will be available for car delivery, as are the shipside tracks on the present concrete wharf. An unusual feature of the shed will be its freedom from structural columns supporting the roof, the plans calling for columns under alternate trusses, the truss spacing being 20 feet.

By the addition of this modern shed, the commission will add a much needed unit to the Houston port equipment, and its design is calculated to serve a diversified commerce. Every care has been exercised to make the shed available for any type of general commodity moving through the port and it is thought that the users of the wharf will find it an economical site for import and export operations. The truss spacing of 20 feet will greatly facilitate the handling of lengthy cargo.

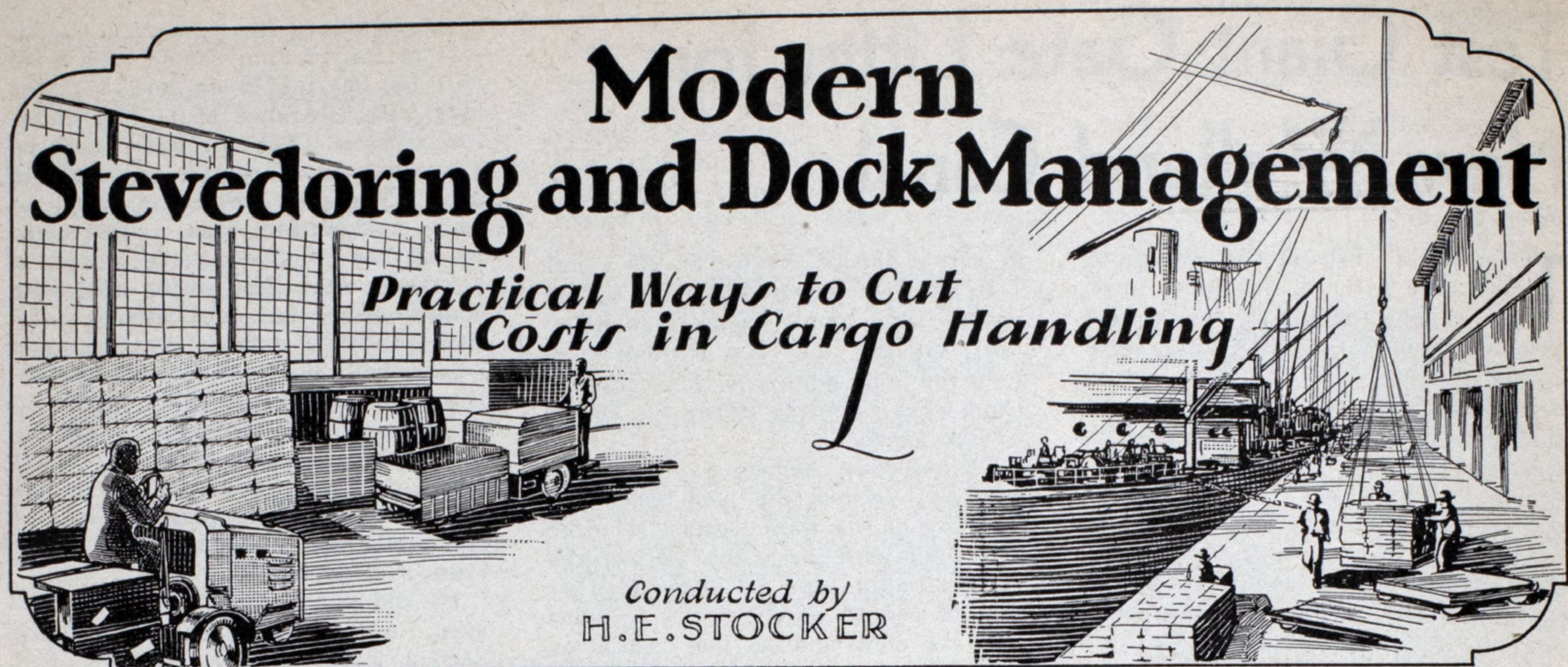


eight ballast tanks as indicated by the mercury columns of the telegauges in the operator's house. These records will be tabulated for future reference of the operator when handling a gate



Pontoon crane of 500 tons capacity undergoing official tests beginning May 15, in the new Welland canal between Lakes Erie and Ontario. These views show the mammoth crane easily lifting one of the 230-ton lock gates. In the final tests the largest gates which are 82 feet high and 45 feet wide each weighing about 500 tons, must be lifted.

This crane is for use in replacing lock gates in case of damage with spare gates floated and towed from the special dry dock where they are stowed.



Pier Layout and Equipment at Panama for Economical Cargo Transfer

By H. E. Stocker

OVER a million and a quarter tons of cargo are handled yearly at the ports of Cristobal and Balboa on the Panama canal. The volume of cargo for the last ten years and the description of the piers and wharves over which the cargo is handled, is shown in accompanying tables.

At piers 6 and 7 it is endeavored to discharge all ships from Central and South American ports landing such cargo as coffee, cocoa, wood, hides, copper, etc. as this is nearly all transshipment freight to be delivered to other ships and can be most economically handled by industrial equipment with the free movement of which depressed tracks would interfere. On the other hand, piers 8 and 9 are used for unloading vessels from Europe and the United States bringing in addition to transfer cargo, large quantities for the Republic of Panama and the Panama canal, nearly all of which has to be loaded in cars, for which the depressed tracks are essential for economical handling.

The general scheme is that if a vessel takes sufficient cargo to warrant the expense, it will be shifted from a discharging to a loading pier.

As to stevedoring equipment used, net slings are most common, although at times board slings, boxes, hooks and other special equipment is used when handling commodities to which the net sling is not adapted.

At the canal the net sling is considered well suited to 90 per cent of the cargo handled. General cargo

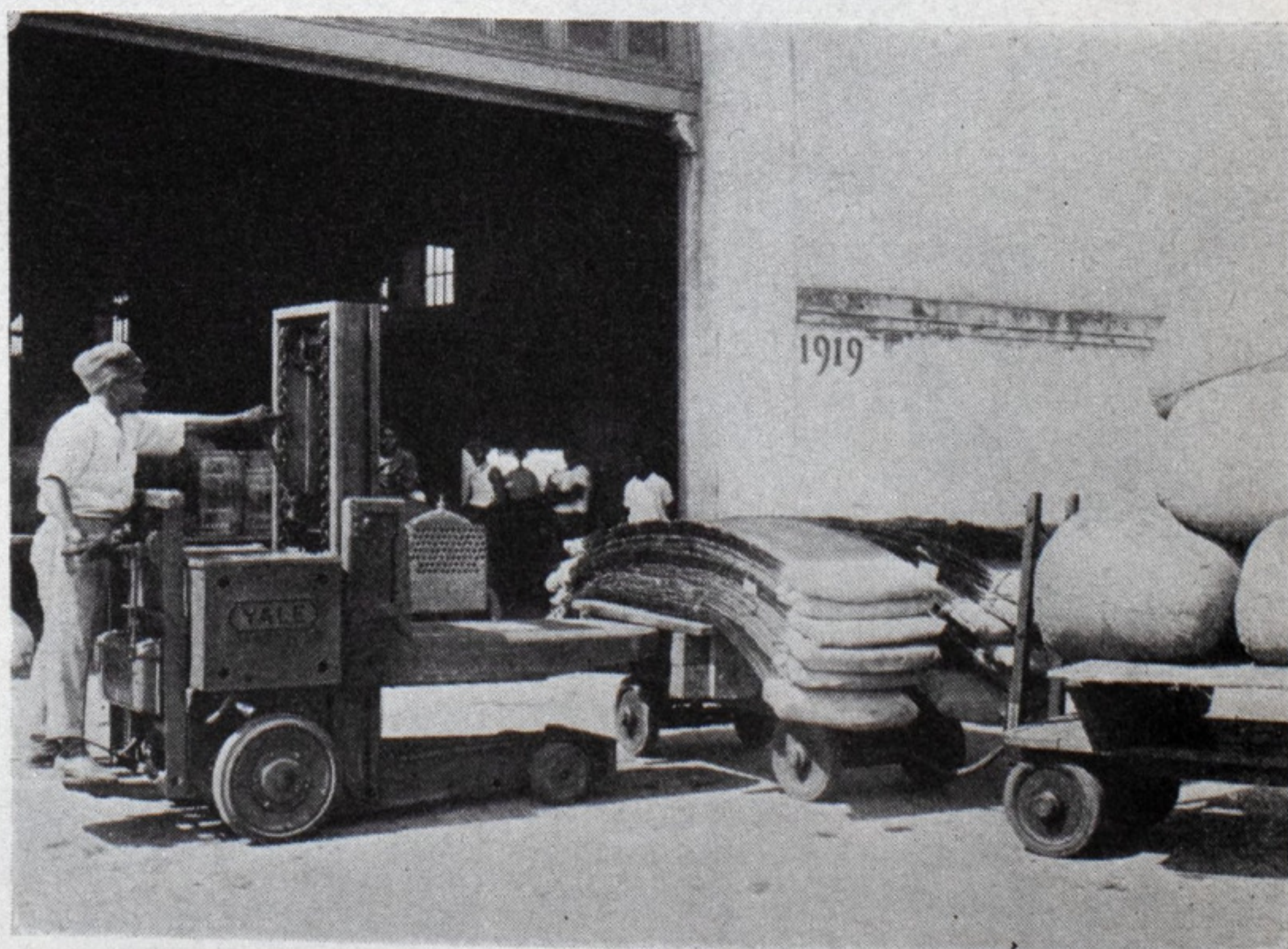
from the United States and Europe is seldom received in uniform lots; packages varying greatly in size, shape and weight. Cargo from Central and South America is largely bagged and to handle the same number of bags of such cargo, with a rope, or combination rope and canvas sling, as handled in a net sling draft, would result in damage to the load either by cutting the bags with the rope, or by their touching the hatch coamings and stanchions, thereby bursting the taut bags. The net sling affords considerable protection to the draft and permits it to be made up in the wings and fore and aft of the hatch, and dragged over the deck to the square of the hatch.

This is a valuable feature in rainy or drizzly weather.

For certain commodities there is a special equipment; in the case of copper for instance there is a modification of the net sling. It is smaller, made of heavier rope and is well padded with "frazzed out" rope. The latter serves several purposes, bars cannot fall out, nor cut the rope of the sling on landing. It also saves considerable wear and tear on decks of steamers and docks.

Large quantities of corrugated sheet iron are handled and to prevent nipping the edges by chain or cable slings and bending corners, a sort of double box sling is used, each box having three sides, and connected

Cristobal, Canal Zone piers. Loaded skids landed on trailers for long haul



to a common eye in which hook is placed, with open sides of the boxes towards each other.

The angle of this connection is such that when weight of draft comes on the eye, the two boxes are drawn towards each other and the draft comes out perfectly level. It is then landed on a skid, the boxes fall off the ends of the sheets and when two drafts have been landed on an elevating platform, the truck takes the load away.

A flat platform truck about a foot high is used for handling very heavy weights that are not loaded on flat cars. The surface area of the platform truck varies from 3x4 to 6x8 feet and is mounted on steel wheels, the number of wheels varying according to the weight to be handled. The platform trucks are hauled from point to point by electric trucks, or one of the tractors.

The industrial haulage equipment at the canal consists of the following: Four Fordson tractors; 1 gasoline shop mule; 34 electric elevating trucks 2-ton capacity; 12 electric elevating trucks 3-ton capacity; 5000 skids (2000 4x6, 3000 5x6); 1 electric tractor; 89 rubber tired trailers; 15 electric platform trucks, 2-ton capacity; 3 portable stackers; 31 flat (heavy weight) trucks (dollies); 438 hand trucks; 6 sections gravity roller conveyors; 4 50-ton stiff leg derrick is provided at Pier 8. There are a total of 10 electric winches for supplementing ship's gear.

A two-ton electric winch when rigged to the cargo masts, locally known as the "monkey rail," on top of the pier takes the place of the ship's outboard boom and one steamer winch. Ships with short booms or disabled winches can therefore work without delay. Also as the ordinary merchant vessel only has two booms to a hatch, it is possible to put them both over the hatch opening and by using two electric winches on the pier, a double gang can be worked in the hatch. Another feature, and an important one, in a rainy port, is that by rigging to the "monkey rail," drafts can be swung through the doors and landed under cover. Of course, this is impossible for short booms, and during drizzly weather a hatch with short booms, and without an electric winch has to be shut down.

Cargo for Transshipment

For the first handling of cargo discharged on the pier the hand truck has been found to be most satisfactory in practically all cases. Nearly two-thirds of the cargo discharged at Cristobal terminal is for transshipment to other vessels for many ports. This transfer cargo comes out of the ship mixed with other cargo for the cities of Colon (freight house delivery) and Panama (by rail), the Panama canal, army, navy and commis-

Pier 7, Cristobal, Canal Zone, Stacking Coffee with Portable Conveyor



sary (rail, truck and freight house). Quick connections are not possible, except by making separations at time of discharge. This can only be accomplished by scrutinizing the mark and destination of each package and applying the distinguishing routine symbol or paint mark. This is impossible should the entire draft be landed on any kind of truck or trailer and hauled away from the gangway. Consequently cargo is loaded

Cargo in Tons Handled Annually at the Panama Canal

Year	Cargo
*1920-1	1,050,565
1921-2	807,897
1922-3	822,713
1923-4	911,676
1924-5	971,291
1925-6	1,064,426
1926-7	1,119,672
1927-8	1,336,511
1928-9	1,559,311
1929-30	1,347,264

*Fiscal year July 1 to June 30. Figures cover both Balboa and Cristobal terminals.

from the sling to a hand truck which takes it to the "check"—usually two clerks, one for the ship and one representing the Panama railroad. It is at this point that custody of the cargo changes hands. Here at the check the package receives its paint mark which in addition to showing destination and routing, is an indi-

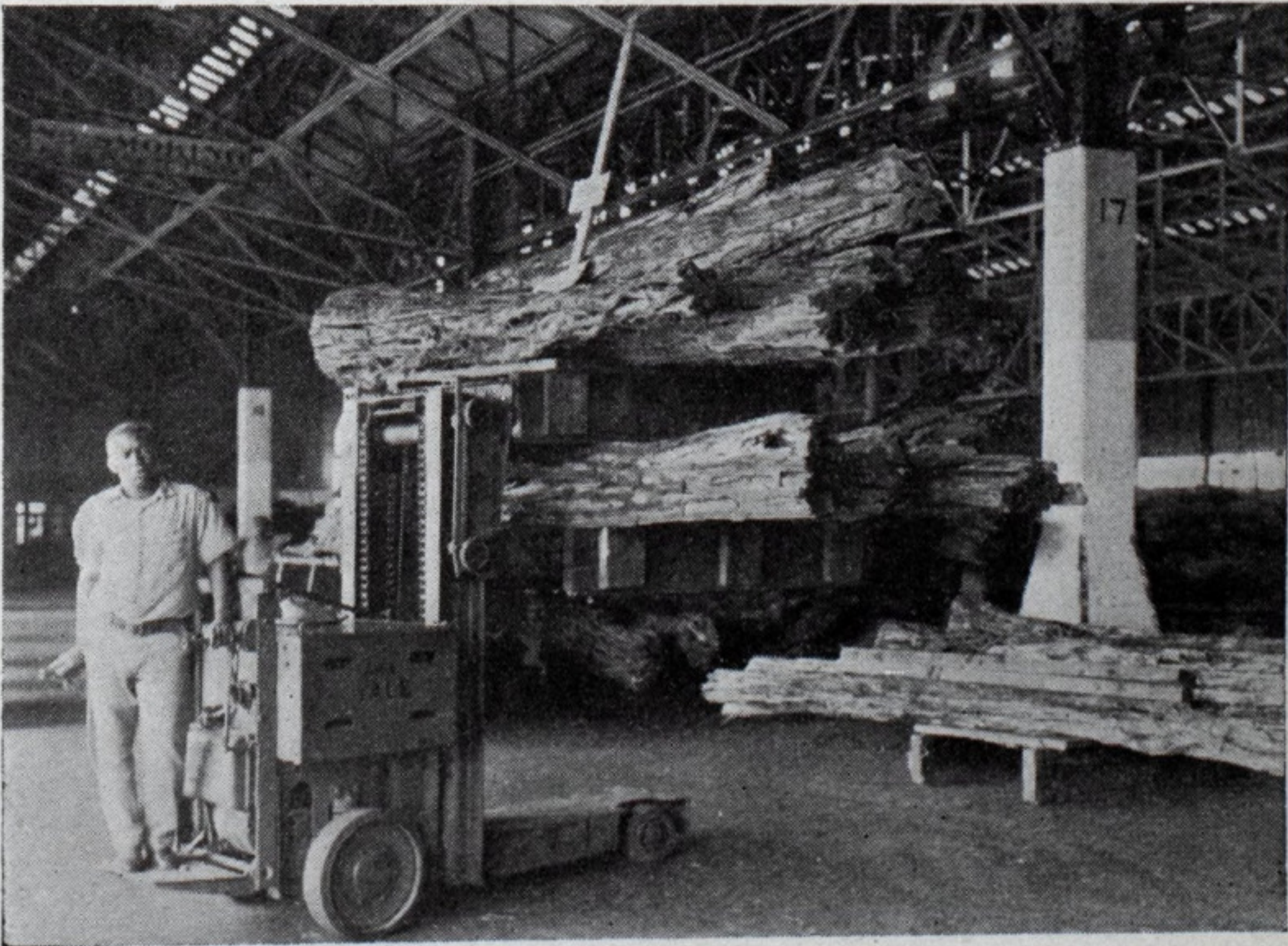
cation that the Panama Railroad company has checked and received this package in its custody, that it must not be checked again, nor permitted to go aboard any steamer until regularly ordered and entered in an outward or "per" check book.

As soon as this symbol is on the package, the trucker either knows, or is directed, where to take it, to a car perhaps, to a skid for the local freight house, to a certain pile or to any one of a row of skids lined up near the check, each bearing cargo of one symbol. The package then leaves the hand truck forever. It has become a part of a unit of from one ton to two tons, all one destination and routing. When the skid is loaded it is moved by elevating truck, or trailer and tractor, to place of storage. By the use of dunnage, when required, loaded skids can be double-tiered and consequent saving of floor space effected.

The necessity for quick connections is not the only reason for checking and separating cargo as it is discharged.

The Panama railroad, while in sole charge of cargo handling on the piers, stevedores less than one-third of the total cargo received and loaded. The ships want a receipt for the cargo as soon as it reaches the pier. If the vessel simply threw

Cristobal, Canal Zone piers. Handling skids loaded with logs. High Lift Truck preparing to tier two skids at the same time



out the cargo, and if it could be made a material handling affair, taking away by the slingload on whatever sort of vehicle was best adapted, a ship would unquestionably be discharged more quickly. On the other hand, this big mixed lot of cargo would have to be checked and assorted before deliveries of any kind could be made, necessitating rehandling, and during all this time the delivering ship would be without a receipt and yet would have no control of the cargo, and would still be liable for it until such time as the receipts were forthcoming. This, of course, none of the lines would tolerate.

One Control Would Save Time

To carry the argument a step further: The steamer that "dumped" its cargo, as putting cargo on the pier unchecked is termed, is ready to receive other cargo, but it cannot be delivered because the desired cargo has been "dumped" by other vessels and has not yet been assorted and checked. Any time made by "dumping" will be more than offset by the time lost waiting for the "per" cargo.

A certain amount of time would be saved and efficiency gained, if stevedoring as well as handling on

piers were under one control, due principally to better coordination, complete control of labor, etc., but even this would not eliminate "ex check." It has been made plain that the sorting must be done, and by performing it at the time the cargo is landed several advantages are gained.

First: Dock space is conserved. A certain proportion of the cargo can be at once loaded in cars, and other lots sent immediately to the freight house. Of course, the proportion of local freight is much less in cargoes from West coast of Central and South America than in those from Europe and the United States, but the same principle applies.

Second: While the check undoubtedly slows up discharge to a certain extent, it does not do so sufficiently to warrant rehandling such a large quantity of cargo as would be the case should everything be "dumped" but large lots of one commodity, on which a running tally can be made without delaying discharge of cargo.

Third: Fixes responsibility for damage. Should cargo become damaged while piled on Panama railroad piers, before being checked and formally received, the disputes as to how and where damage occurred

would be endless. Under the present methods this is simple. If cargo shows up at the check in a damaged condition, the ship is to blame. If damage develops after that time, the Panama railroad is at fault.

Fourth: Enables almost immediate deliveries to be made to the on-carrying steamer.

Cargo Delivered to Steamer

When cargo is ordered to be delivered to a steamer conditions tending to rapid handling are very much more favorable.

From a communication received from the agent of the steamer desiring to take cargo a loading order is prepared and mimeographed, so that all foremen and check clerks interested may be informed as to exactly what cargo the steamer will lift. As soon as this order is issued every skid and every pile of the cargo so ordered is again tagged showing steamer for which it is ordered.

In case of very large lots where it would be inadvisable to use up too much space with skids, the cargo after being taken to storage point in the usual manner, is placed in high piles by means of stackers and when ready for delivery, is loaded on skids or platform trucks, and taken to receiving steamer.

Dimensions and Description of Terminals at the Panama Canal

Cristobal—Canal Zone

There are three piers and two wharves all in one enclosure, and, as far as pier operations are concerned, under one head. The piers themselves are covered, but the roadway connecting them is open. All piers have concreted open storage between shore end of shed and connecting roadway about equivalent to that at sea end of each pier.

Pier 6. Steel and Concrete, 1158 feet long (longest dimension) 201 feet wide. Shed 160 feet wide, 945 feet long. Apron 19 feet wide. Open storage at sea end, 20250 square feet. Single track full length of each side of the pier down the apron at floor level. Instead of the usual cargo mast or "monkey rail" for use of vessels when booms are inadequate to reach the apron, there are on each side of the roof cantilever arrangements anchored to a track so that they may be placed in desired locations and which answer all purposes of the fixed superstructure on the other piers or wharves. Pier 6 has fuel oil lines.

Pier 7. Steel and Concrete, 1156 feet longest dimension, 212 feet wide. Shed 932 feet long, 164 feet wide. Apron 24 feet wide, 17,800 square feet of open storage at sea end. Single track on floor level down each apron. Pier 7 has a fixed superstructure to which blocks may be fixed at frequent intervals the full length of each side. This superstructure overhangs the apron 8 feet. Pier 7 has fuel oil lines.

Pier 8. Steel and Concrete, 1042 feet longest dimension; 209 feet wide. Shed 870 feet long, 172 feet wide. Apron 18½ feet wide, 16,825 square feet open storage space on sea

end. Superstructure on Pier 8 is fixed and has "shackles" at frequent intervals, although it does not overhang the apron. Pier 8 has a single track at floor level on each apron and double depressed track down the center of the shed with a total capacity of 42 cars. Pier 8 has fuel oil lines.

Wharf 9, 1070 feet long; 75 feet wide from string piece to edge of the one depressed track. The apron is 22 feet wide and carries one track at floor level. This wharf has a common roof with what is called the annex, a building parallel to wharf, 74 feet wide and 1000 feet long, used as a baggage and mail storage, local freight house, short-shipped room and cargo storage. Usual superstructure as at pier 8. Between the depressed track on wharf 9 and the wall of the annex (pierced at frequent intervals with doors) is a platform 14 feet wide so that the cars on depressed track are accessible on both sides. Pier 9 has no fuel oil lines.

Wharf 10, is a re-entrant angle continuation of wharf 9. It is 425 feet long on face, 102 feet wide with a shed 340 feet long and 80 feet wide. The apron is 20 feet wide, and there is no track connection on the wharf. Usual superstructure. No fuel oil lines on this wharf.

Mindi Wharf. There is a small wharf at Mindi three miles up the canal built primarily for handling explosives, but also used for discharge of cattle. The wharf is open except for a small shed and has a depressed track back of it with space for six cars. It is constructed of wood, and is 133 feet long by 34 feet wide with mooring dolphins at suitable distances from each end. Has no fuel oil lines.

Balboa—Canal Zone

There are three wharves and one pier. Wharves 14, 15 and 16 in one enclosure, and Pier 18 in another. As far as pier operations are concerned they all come under one head, which, in turn, is under the Cristobal organization. A brief description of each follows:

Wharf 14—Steel and Concrete. Open wharf 775 feet long. Single track extends full length of wharf. Load capacity 750 to 1000 pounds per square foot. Suitable only for handling cargoes that are not susceptible to weather damage.

Wharf 15—Steel and Concrete. Open wharf 1146 feet long. Is a continuation of, and in direct line with No. 14. Single track extends full length of wharf. Load capacity 400 to 680 pounds per square foot. Suitable only for handling cargoes that are not susceptible to weather damage. Has fuel oil lines.

Wharf 16—Steel and Concrete. Open wharf 742 feet long. Is a continuation of No. 14 and 15, at an angle of 13 degrees, 30 seconds. Single track extends full length of wharf. The same track serves wharves 14, 15 and 16 with two crossovers from land tracks. Suitable only for handling cargoes that are not susceptible to weather damage.

Pier 18—Steel and Concrete. 1000 feet long and 201 feet wide. Shed 1000 feet long, 160 feet wide. Apron 19 feet wide. Open storage at sea and 6432 square feet. Single track extends full length of each side of pier down the apron at floor level. Has fixed superstructure to which blocks may be attached at frequent intervals the full length of each side of shed. This superstructure has no overhang.

Terminal at Portland, Maine Now in Full Operation

By A. H. Morrill

THE inauguration of service on April 1, 1931 at wharf No. 3 marked the completion of the Portland Terminal Co.'s program of wharf development in Portland, Me., harbor which has been under way for over a year.

This wharf, which is of pile and timber construction, 1500 feet in length, with 30 feet of water in the berths at mean low water, provides for the transshipment of pulpwood, lumber, china clay and other bulk commodities. It is divided into two sections, each section being served by its own set of tracks. The easterly section, 500 feet in length, is served by three tracks, while the westerly section, 1000 feet in length, is served by four tracks.

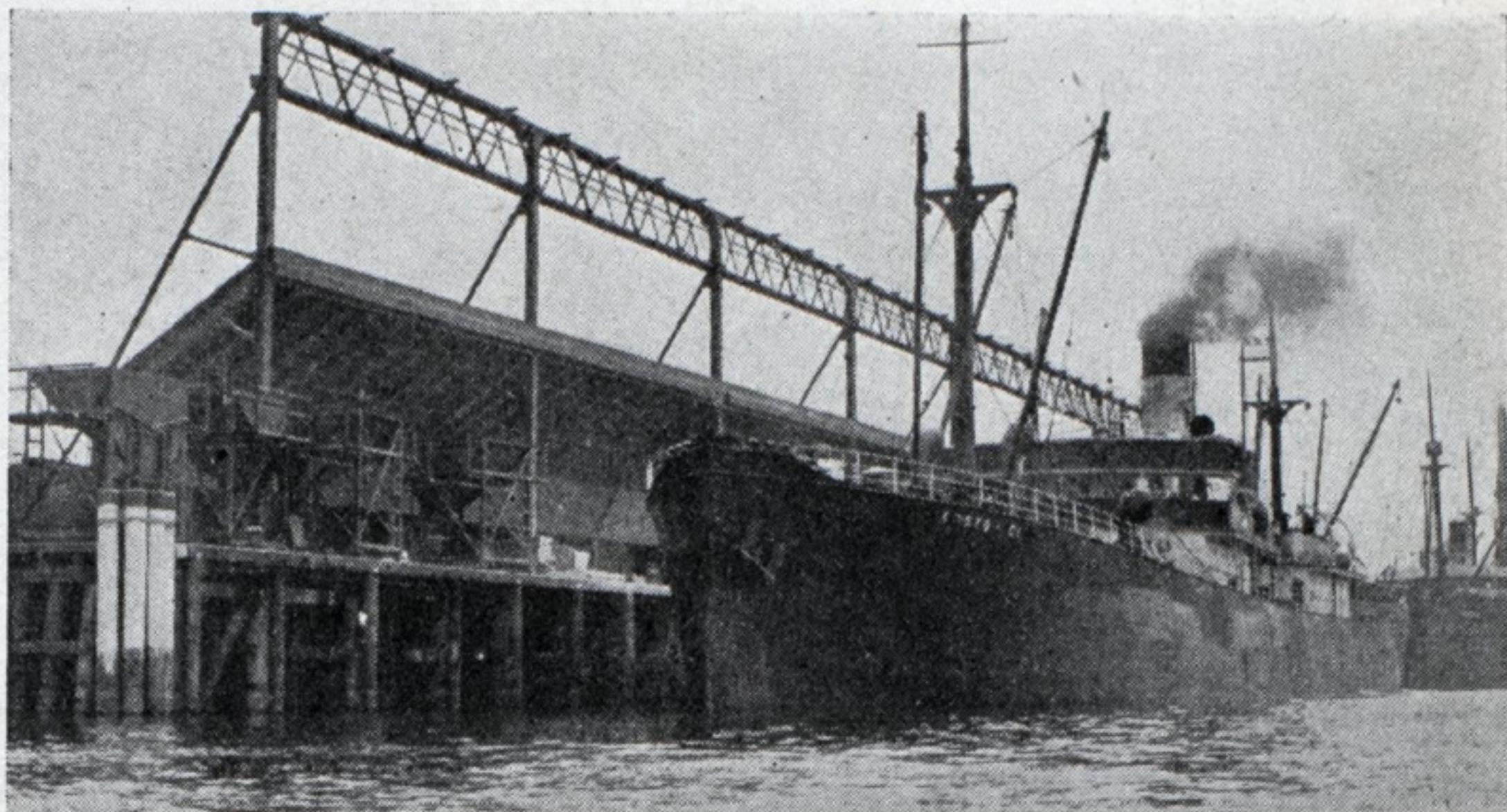
The structure is of the usual pile and timber construction, the piles ranging in length from 65 to 110 feet.

The easterly section of the wharf is specially constructed for handling china clay, and is equipped with 45-foot Burton masts located 10 feet back from the face of a car level platform 26 feet in width. Clay is handled out of ships in hand loaded buckets and dumped into steel hoppers on the platform. From these hoppers it is handled into box cars in self-dumping buckets attached to lift trucks, and dumped in place without further trimming. This arrangement displaces the former method of handling into cars by hand barrows and trimming back by hand.

Located in a steel building at a convenient location on the platform is a 50-horse power generator set for charging batteries for lift trucks.

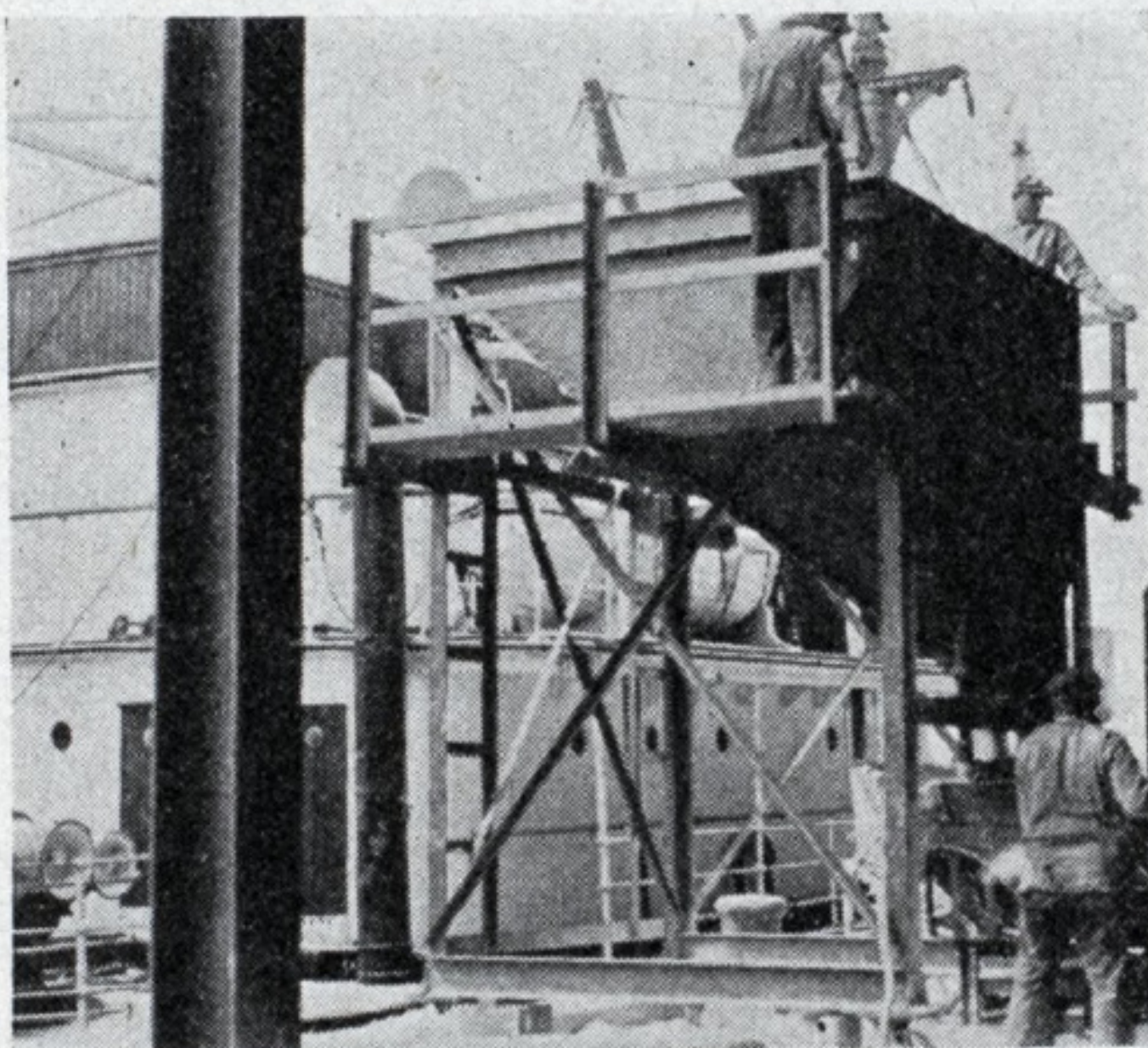
The easterly section of the wharf is equipped with four Mead-Morrison gantry cranes having a run of 950 feet and spanning a car level platform 20 feet in width. These cranes

Wharf No. 3 at Portland, Me. Steamer Discharging China Clay. Steel hoppers for transferring Clay into Box Cars



have a capacity of 10 tons at a radius of 20 feet and are equipped with 60-foot booms, capable of loading into open top cars on any of the four adjacent tracks. They have a hoisting speed of 300 feet per minute, a revolving speed of 3 revolutions per

operation for only a short time and no definite figures are available as to cost of operation and discharging capacity, it has been demonstrated that in speed and capacity they are in every way suitable.



Equipment for Discharging China Clay

minute and a traveling speed of 150 feet per minute. They are electrically operated with double drum hoists and independent boom hoists. Power is taken from trolley wires located under the platform on the

Ocean and Rail Terminal Provides Good Service

THE new ocean terminal of the Pennsylvania Dock & Warehouse Co. recently completed in Jersey City, N. J., is another example of the combination of pier and warehouse to provide adequate service to those using the terminal.

Two piers and a group of warehouses are completed, while plans contemplate additional facilities in the future.

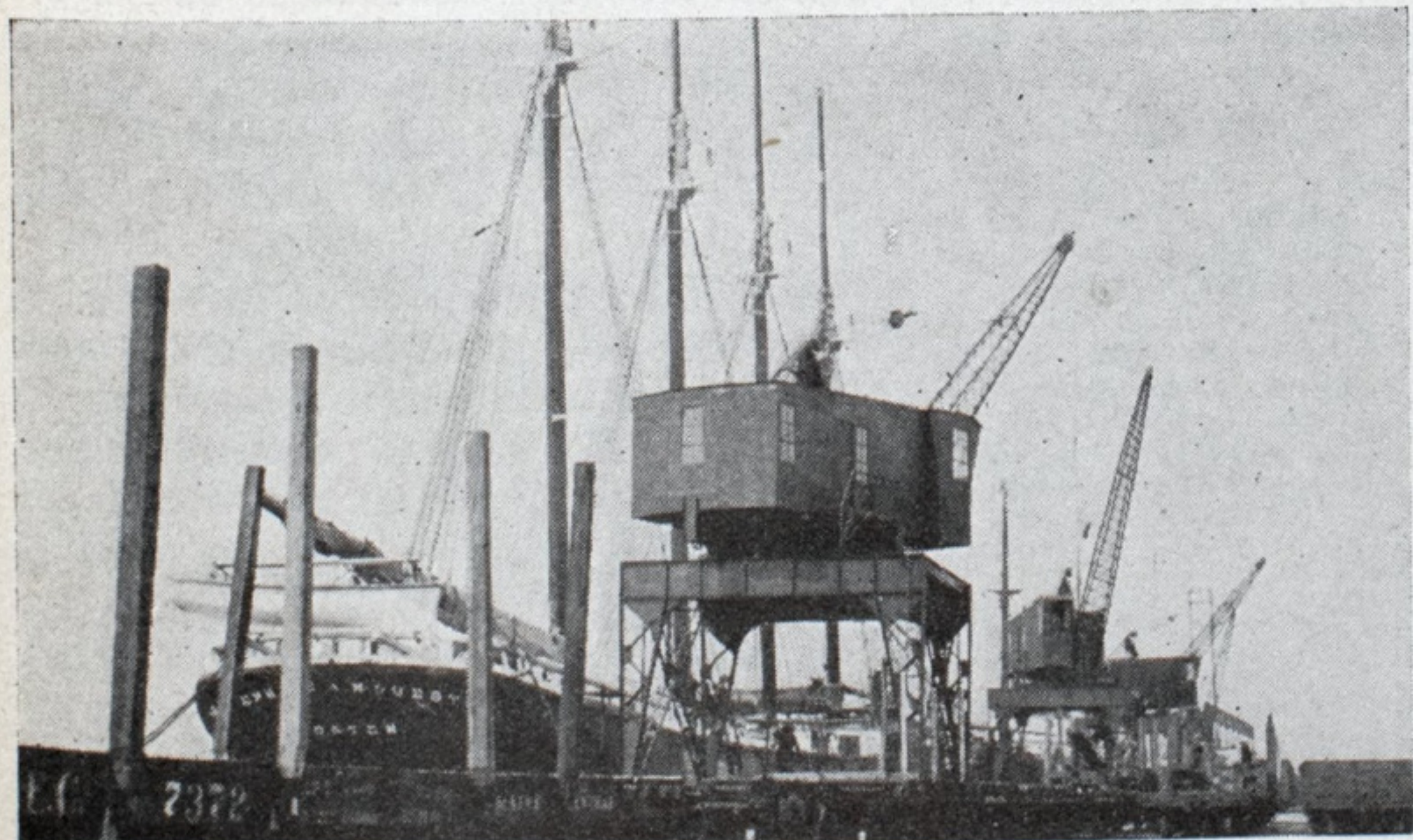
Pier D is a double decked pier 854 feet long and 125 feet wide with a shed 834 feet long and 115 feet wide. One depressed track is provided down the center of the pier with provision for a second track if need for additional trackage arises in the future.

Four elevators of 10,000-pound capacity are provided to handle cargo between the two pier decks.

Pier F is also a double decked pier. It is 160 feet by 915 feet with a shed 150 feet by 890 feet. Three depressed tracks are laid down the center of the pier. Six elevators are provided, of the same capacity as those in pier D.

Both piers are equipped with cargo masts. At pier D the masts are 46 feet above the second deck. At Pier F the masts are 49 feet above the second deck.

The floors in both piers are very good. One is of concrete, the other of special concrete with iron hardener.



Cranes discharging lumber from schooner and steamer on four railroad tracks at Portland, Me.

Safe Stowage Is an Essential in Efficient Operation

By H. A. Rhatigan

SAFETY at sea is substantially dependent on proper stowage of cargo. Improper stowage may completely invalidate all the advantages of a stout ship, a fine command and a good crew. It menaces the lives of passengers and crew, and may mean loss of property, for cargo improperly stowed is certain to shift, cause the ship to list, sail improperly and possibly result in its capsizing.

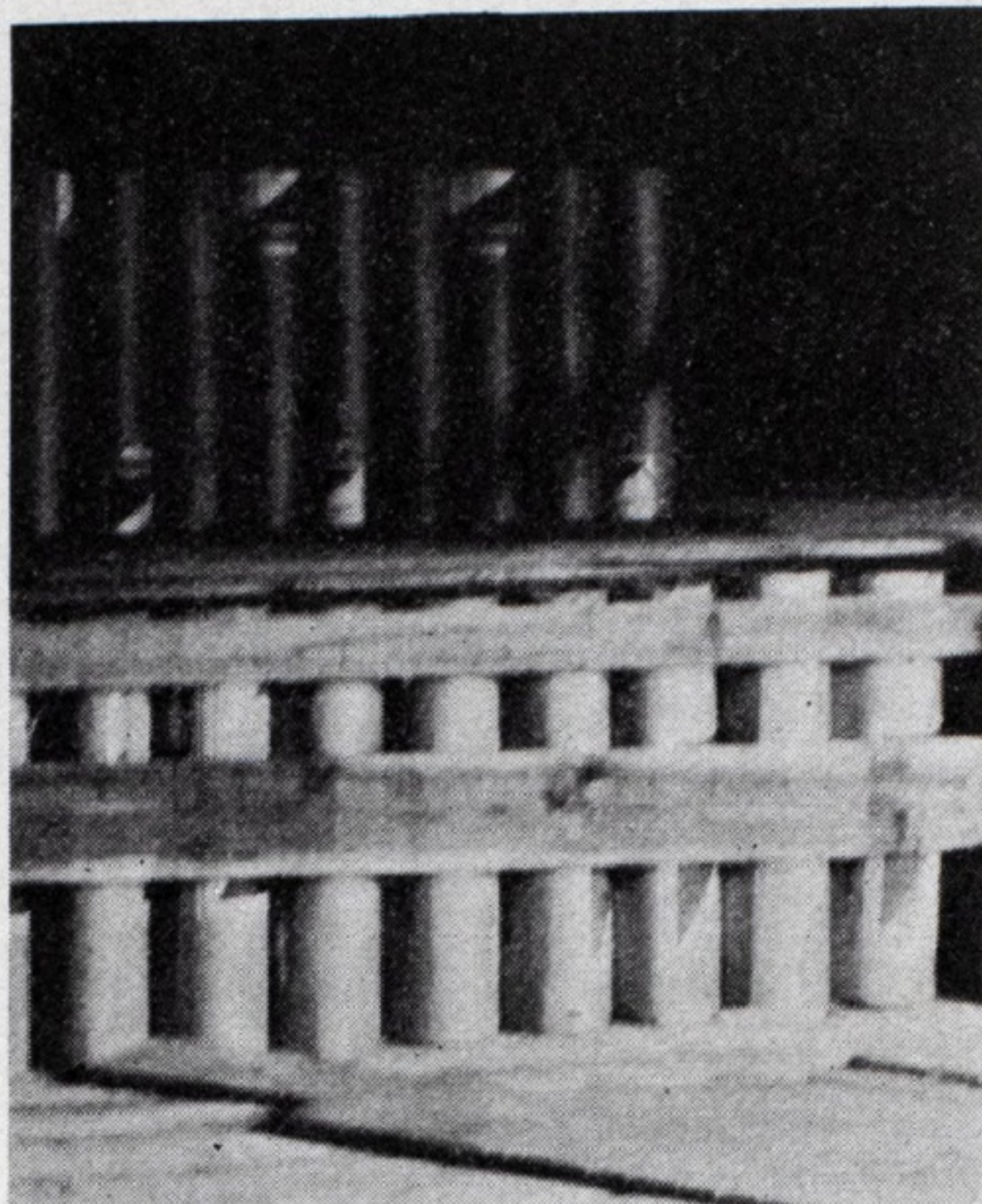
Much is required of the man who loads a vessel. He must know his business and how to handle men. He personally supervises the loading and stowage of cargo and does not permit a ship to sail without his final inspection. His stevedores know how to carry out his orders, and they function under the supervision of foremen who are expert in their capacities.

Cargo must be properly chocked and secured to prevent the slightest shifting. Blocks of iron or wood or miscellaneous cargo are inserted in all the empty spaces between articles, so that the vacant spots are completely occupied. In a properly stowed ship there is never any necessity for the crew's chocking cargo after the vessel has left port and commenced its voyage.

Chocking and Securing Cargo

The chief officer supervising stowage must load his heavy and lightweight articles in proper location according to the ports of call, yet arrange them so that they can be readily discharged. At the same time he must see that the vessel does not lose stability. Freight must be so placed that the cargo for each port is easily accessible without

This is a full abstract of an article by H. A. Rhatigan, Traffic Manager, W. R. Grace & Co., which appeared in *The Grace Log* for January-February, 1931.



Claims Are Eliminated by Correct Stowage

that which is intended for subsequent ports being confused with it.

When loading for more than one port, only cargo for one port should be worked at a time into any particular hatch. To do otherwise involves great risks of confusion and subsequent short or over landing at the various ports. Care in this particular saves time later on in avoiding delays at various ports. Poor stowage is the reason why vessels discharging at intermediate ports work a few hatches only, causing the remainder to be idle and so materially hindering rapid discharge. Good stowage would, in such cases, have resulted in all hatches being worked more or less simultaneously, with the result that the time of the voyage would be shortened or that more time might be had at a port where this might be used to advantage.

The equal distribution over all holds of heavy cargo, such as ore, is to be

avoided, as that would place too much weight forward and aft, making the vessel sluggish in rising to head seas and rendering it liable to undue strain in heavy weather.

Cargo damage results from carelessness in loading and discharging, such as heedless winch work, the lowering of slings with heavy drafts of cargo too rapidly down upon cargo already placed in the holds. Cargo hooks, while indispensable in the handling of some freight, if used in the handling of commodities such as bag cargo, bale goods, hides or similar exposed or unprotected freight, are oftentimes the cause of claims against the line.

Efficient stevedores know how to operate winches and that it is not necessary to drag cargo over a dock floor or over other freight within the hatches and holds of a ship. They have among their equipment, steel and wood platform sleighs which are drawn by motor tractors, while the handling between decks is done carefully by steel drag plates on which the freight, after being lowered into the hatches, is placed and dragged over the walking boards covering other freight, and safely stowed away. Rope and wire net slings are used for certain kinds of small cargo, while box and crate slings are brought into use for other materials, and wire cables and chain tackle are used for heavy merchandise and canvas slings for all bagstuff and small, light packages.

Every precaution is taken in the handling of all dangerous shipments, this class of goods being carefully inspected before placing aboard and stowed in well-ventilated compartments as far away as possible from the engine and boiler rooms, bunkers, passenger and crew's quarters.

Dunnage (pieces of wood or planking) should be freely used to insure proper stowage. Used as a fill-in around most packages, it also serves as a protection, especially when used as flooring or walking boards between tiers of freight. Failure to use sufficient dunnage results in shifting of cargo.

Freight, such as barrel goods, rolls of paper, newsprint, roofing and other cylindrically shaped cargo is stowed in head-up position. This prevents it from sliding and acts as a stay against damage to other materials.

All moist or liquid freight is always separated from the dry goods. Cotton and wool in bales, oils, turpentine and such freight is never placed in the same holds or compartments. These commodities are separated by substantial bulkheads in order to withstand fire hazards. Cotton in particular is protected with 'tween deck hatches, thoroughly secured and segregated as, when damp, it is subject to spontaneous combustion.

Odorous materials and moist cargo exuding an objectionable odor are always stowed far away from green fruits, edibles and other like freight.



Discharging Three Ton Motor Truck. Care in Handling and proper stowage are necessary to good ship operation. Goodwill and revenue are both increased by such attention

Useful Hints on Cargo Handling



CASE gasoline and kerosene also drums of petroleum products are handled on gravity roll conveyors from trucks to the floor of the warehouse for storage at the new case oil terminal, Los Angeles harbor. A four foot wall completely surrounds this terminal, the inner wall being along the land side building line of warehouse, and the outer wall being along the face of the wharf. Trucks back up to the inner wall and the case and drum goods are handled by the gravity roll conveyors to a point of rest in the warehouse.

On outgoing shipments, case goods are placed on sling boards on four wheel trailers and then lifted by the ship's gear into the hold of the vessel. Drums are rolled out from the warehouse on to the wharf and are picked up by ship's gear.

Plan to Avoid Delays

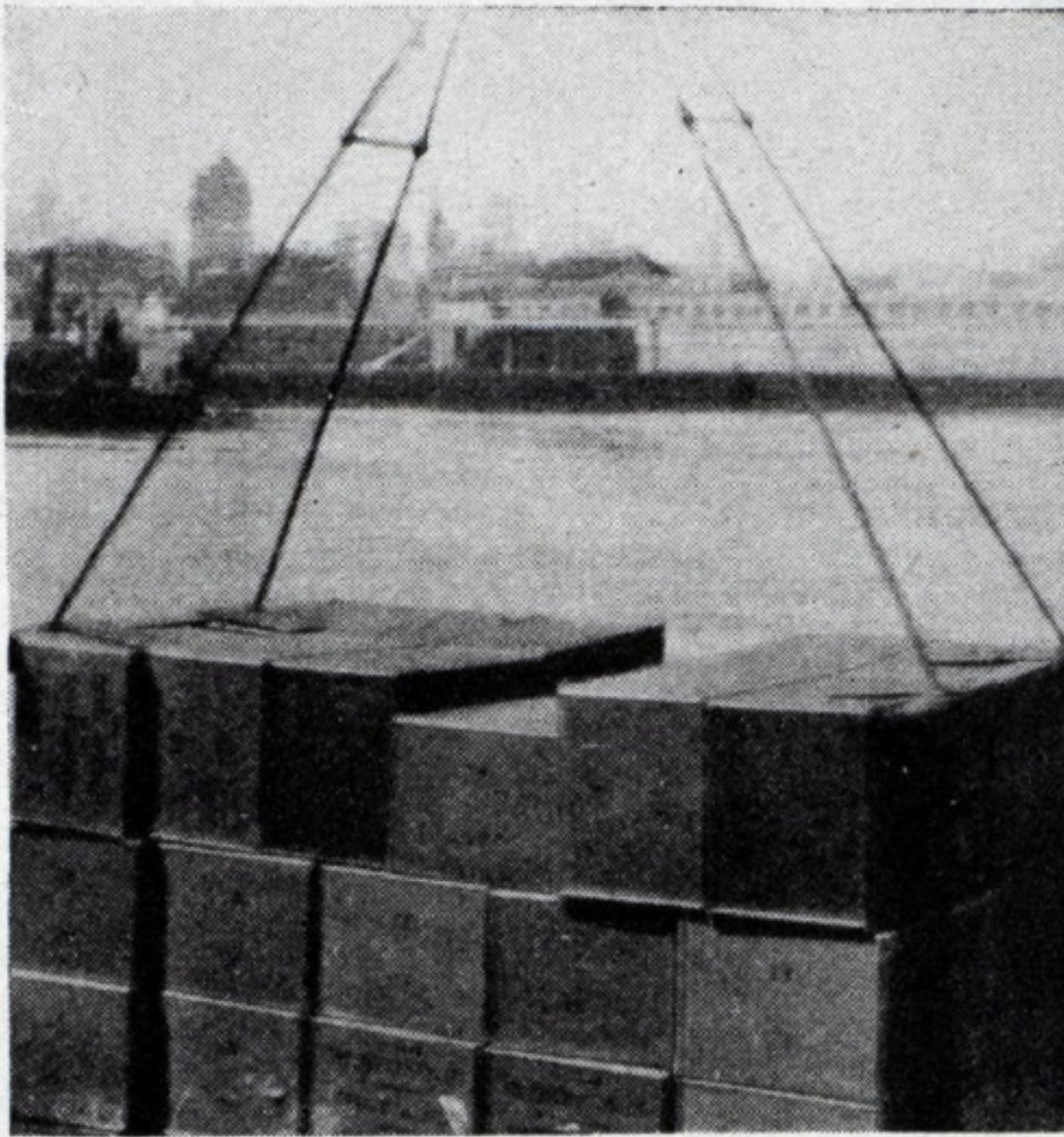
THIS scene was recently witnessed at a New York pier. The gang for No. 1 hatch was ready to start work but a wedge was not removed so in order to get the tarpaulin off, the mate had to rustle a hammer. Then a longshoreman tried to knock the wedge out but it was a carpenter's hammer and it did not accomplish anything. Following which the mate had to rustle a hammer and finally arrived with one with which the wedge could be knocked out. Then the tarpaulin was removed and the hatch finally opened—but it was 8:30 a. m.—one half hour lost on unproductive work. Proper planning would have avoided 50 per cent of this delay. Steel hatch covers of the best design would have reduced the nonproductive time also.

A few things that were wrong on a ship loading cargo at an Atlantic port.

1. Leaky steam valve port winch No. 2 hatch.
2. Uninsulated steam lines on deck.
3. Leaky flange connection steam lines to winches.
4. Loosely piled hatch covers—endangering safety of longshoremen.
5. Hatch beam in place in middle of hatch while working cargo, a danger to men working hatch.
6. Small platform slings for cartons and miscellaneous cargo. (e. g. lamp chimneys). Larger sling would

THIS page is being devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.



Good Type of Spreader Used on Pacific Coast. Pressure Against Ends of Cans

have increased the number of tons per hatch hour.

Careful Hatch Tenders

THE accident prevention department of the Pacific American Steamship association and allied groups, by calling attention to accidents and their causes, is aiding in safer and more efficient operation.

In answer to the question: "Why is it necessary for a hatch tender to swing or steady a load so that it will go into a hatch when some ships find it unnecessary and are seeking exemptions from using hatch tenders, and especially as we have many serious injuries due to the practice of hatch tenders and others guiding loads in and out of the holds?" Byron O. Pickard, safety engineer in charge, agreed that it is a dangerous practice and that if it is found necessary for hatch tenders to guide loads, they should be made fully aware of the hazards of the moving load and the open hatch to which they are exposing themselves. Many accidents occur through moving loads, striking hatch tenders and other deck employees and instructions

should be given winch drivers and hatch tenders to be on guard against this danger.

Good Hatch Covers Pay

MANY ships do not realize the truth of the slogan, "the ship pays the bill." It is not uncommon to see broken or ill fitting hatch covers used, especially on the 'tween deck hatches. Neither is it uncommon to receive an accident report of injury due to stepping on a short or broken hatch. In most cases the compensation paid would probably have outfitted the entire hatch or for that matter all the hatches of the ship with new hatch covers.

In addition to the compensation cost, the work is interrupted for a longer or shorter period, while the injured man is being taken care of. Cargo may have been damaged. The morale of the men is likely to have been affected, resulting in slower and less efficient work. And worst of all is the fact that a fellow man has been injured.

It is not necessary for an accident to happen to make the use of poor hatch covers unprofitable. No man can hit his best stride, if at every move he has to watch his step to keep from falling. The conditions of the covers is an indication of how things generally are done on that ship. The sight of them in poor condition has a detrimental influence on the workman and he is likely to be less careful in regard to the safety of both himself and cargo.

(Taken from a report by Byron O. Pickard.)



Special Type of Hand Truck for Use in Handling Large Cases

Personal Sketches of Marine Men

Calvin Austin, Retired Chairman, Eastern Steamship Lines, Inc.



FROM office boy to president of one of the largest American shipping enterprises, marked his progress.

HIS long and active career has contributed much to the upbuilding of coastwise transportation.

NEGOTIATIONS for the Cape Cod canal and New England tariff adjustments typify progressiveness.

THE resignation of Calvin Austin as chairman of the board of the Eastern Steamship Lines Inc., Boston, on May 4, brought to a close the active career of one of the most important figures in maritime affairs on the Atlantic coast during the past 50 years.

Born in Fryeburg, Me., Mr. Austin was educated at the Fryeburg academy. At the age of 16 he went to Boston and entered the employ of the Sanfords, pioneers in Maine coast steamship service. In 1875 he began work as an office boy for the Sanford Independent line at \$3 per week and gained rapid promotion through the various departments of the business.

In 1882 the Sanford line was sold to William H. Hill, a Boston banker, and Mr. Austin was made general manager. The name of the company was changed to the Boston & Bangor Steamship Co. and its service expanded widely along the north Atlantic coast. New and improved types of excursion steamers were developed under his suggestion and the line became one of the most important units in New England's transportation system.

In 1900 Charles W. Morse, whose financial genius deeply influenced the first decade of the present century, obtained control of the Maine coast lines which he consolidated under the name Eastern Steamship Co. Mr. Austin was chosen to manage the affairs of the combined companies and in 1905 became president of the Eastern Steamship Co., operating lines to Portland, the Kennebec river region, Bangor and Bar Harbor in Maine and to St. John, N. B. During the same year the Metropolitan line, operating between Boston and New York, was acquired by the Eastern company and the steamers HARVARD and YALE were built for this service under Mr. Austin's guidance. These steamers, together with the GOVERNOR COBB, were the first equipped with turbine engines to be built in this country.

In 1906 Mr. Austin became the head of the Consolidated Steamship lines which included the Clyde and Mallory lines, New York & Cuba Mail Steamship Co., New York & Porto Rico Steamship Co., the Hudson River

Night line, Joy line, Eastern Steamship Co. and the Metropolitan line, a combine capitalized at \$60,000,000 operating in all 105 ships in addition to barges, towboats, etc. This enterprise was dissolved in the financial panic of 1907 and during the subsequent period of readjustment Mr. Austin as president managed the complex financial affairs of the Eastern Steamship Co. and the Metropolitan line, which were reorganized into the Eastern Steamship Corp. in 1912.

At this time the Boston & Yarmouth Steamship Co. Ltd., was purchased from the Canadian Pacific railway and at the close of the World war a further reorganization of the company resulted in the present organization known as the Eastern Steamship Lines, Inc. Later the Old Dominion line, operating between New York and Norfolk, Va., the Richmond-New York line and the Gulf & Southern Steamship Co. were purchased, the combined interests now representing one of the largest shipping enterprises in the United States.

To the enormous details of this business Mr. Austin devoted his personal attention. He supervised the building of 21 ships, including the BOSTON, NEW YORK, YARMOUTH and EVANGELINE. He was also instrumental in negotiating with the government for the purchase of the Cape Cod canal. His long career coincided with the progress of this business from its almost primitive condition in the early seventies to its present status. His vision was responsible for many improvements both in type of steamers used and in the character of service.

His negotiation of the first tariff adjustment between the New England railroads and his own company is typical of the progressive spirit which dominated all his activities, and the Eastern Steamship Lines, Inc. is in large part a monument to his efforts. Jere A. Downs, Boston banker, has been elected chairman to succeed Mr. Austin and Capt. Eugene E. O'Donnell, widely known in marine affairs, continues as president.

Mr. Austin's resignation was brought about through impaired health. In private life he devotes himself to his delightful Calmore Farm estate in Dunstable, Mass., where he enjoys his principal hobby, which is horses.

Atlantic Passenger Trade

(Continued from Page 17)

WESTERNLAND, 16,000-ton steamships, of prewar design it is true, but of post-war build nevertheless; these were originally placed in commission as cabin steamers, but cabin class has latterly been discontinued aboard them, the accommodations now being occupied by tourist third as the highest class carried.

Five Baltimore Mail Liners

Further, the new Baltimore Mail Steamship Co. is entering the transatlantic service this year with five units somewhat similar to the American Merchant liners, to cater likewise to one class of cabin passengers exclusively.

It is interesting to observe, by the way, glancing toward the other shipping routes of the world, that the P. & O. company plans hereafter to operate its 16,000-ton liners MOLDAVIA and MONGOLIA also as specialized tourist steamers.

One has but to follow the newspaper notices of arriving and departing passengers on the transatlantic steamers to realize the growing popularity of the less expensive modes of travel, for aristocracy is generously represented aboard the cabin liners. And lately we have had an instance of royalty itself a patron, not of a first class steamship, nor even a cabin liner, but actually of a ship whose highest accommodation was that of tourist third cabin.

Between the superior attractions of cabin class at hardly greater expense and the excellent standards of tourist third at decidedly less expense, it is not surprising that second class is well on the way to the discard. Existing of course, only aboard liners catering to first class also, it is beginning to disappear even there; on the LEVIATHAN, HOMERIC, and BELGENLAND, for instance, second class has been discontinued and its quarters devoted to the accommodation of tourist passengers.

The latest big development in the transatlantic passenger trade is the sudden revival of the craze for speed.

In the years following the close of the war, with the world brought to its senses and in no humor for any kind of extravagant competition, as the effect of the ordeal through which it had passed, it looked pretty much as if we had at last broken away from that mania for more and more speed and luxury in crossing the Atlantic. One after the other, shipping leaders announced as their definite conclusion that the building of supersteamships was a thing of the past; there were already more of them in operation than the trade really could support.

But it happened that the French line, obligated to do so under the terms of its contract with the French government, entered into years be-

fore, found it necessary to begin the construction in 1924 of a new express steamer. This, coming out in 1927, proved to be a ship of about the tonnage and speed of the OLYMPIC and AQUITANIA, just another superliner, then.

So luxuriously was the new ILE DE FRANCE fitted, however, that the other steamship lines could not fail to regard her as an extremely uncomfortable competitor for their own ships. As a result the trade started talking again about new thousand-footers.

At first little was mentioned concerning higher speeds. The leadership of the MAURETANIA, dating from 1907, was something which, to overthrow, meant building and operating expenses rather greater than the companies cared to let themselves in for.

But around 1925 certain experiments with small vessels had proven that steam turbine efficiency, notably in the matter of fuel economy, could be materially advanced through the employment of higher steam pressures.

Embarking subsequently on an extensive program of liner construction, the Canadian Pacific Steamships, Ltd., took full advantage of the new discovery in connection therewith, further applying the principle in the re-engining of five of its units of prior construction.

As already indicated, advance in speed standards goes hand in hand with advance in engineering efficiency. Accordingly, against the 16 knots or so to which cabin liners were originally designed, the Canadian Pacific company was in a position to power its new DUCHESS class of cabin steamers to 18 knots. Of course, this was not exactly a record for cabin steamers, for the CARMANIA, CARONIA, PRESIDENT HARDING, and PRESIDENT ROOSEVELT, not to forget the GEORGE WASHINGTON, were indeed 18-knot ships and better; but they had all been built in the start for first class passenger service.

Speeding Up Intermediate Liners

The Hamburg-American line, in building up its services again after the war, had topped off its new fleet with a quartet of intermediate liners, of 21,000 tons apiece, at 16 knots. Such was the enthusiasm over the engine economy afforded by the use of steam at the high pressures now introduced, coupled with the new trend toward higher speed, that this company has caused those four liners to be reengined on the new principle, and to a speed of as high as 20 knots.

Meanwhile that revival of interest in the building of new superliners has developed into a rivalry as intense as has ever existed in former years. At first the steamship lines were backward about committing themselves to a start, due to uncertainty as to the choice of propulsive agency and a preference to see first what "the other

fellow" was going to do about it.

It was the North German Lloyd that boldly took the initiative, contracting late in 1926 for the construction of two vessels ranking in size with the biggest ships ever built. Needless to say, the possibilities of steam at the new high pressures were fully exploited. While the specific desire of setting new records for speed was repeatedly disclaimed, the schedule devised for the new liners—five days between New York and the English channel—was unprecedented. To abet their engines in maintaining the necessary speed, various novel features were introduced into the design of the hulls and superstructures of the ships with a view to reduce water and wind resistance to a minimum.

Germans Take Speed Record

With the appearance of the BREMEN in service in the summer of 1929 and of the EUROPA early in 1930, then, the MAURETANIA has at last been displaced in speed leadership on the Atlantic, after having held it for over twenty years. These new German liners have set the record at somewhat less than four and three-quarters days between New York and the English channel ports, equivalent to about four and one quarter days over the Queens-town course; they have incidentally scored their best averages across the Atlantic at precisely the same figure—27.91 knots.

If ever there were a vindication of that famous saying "Do it now!" we certainly have one here. By taking a chance—definitely deciding upon a course of action and straightway pursuing it—the North German Lloyd has actually succeeded in building its new superships and placing them in service while the other companies were still hanging back and talking about it instead of getting started themselves. Now, of course, the latter have at last gotten under way with their plans; the Cunard and French lines are each building what they have respectively announced as the biggest ship ever, the speed intended being something like 30, maybe 32, knots. But it will take 2½ to 3 years to build them, all of which time the BREMEN and EUROPA will be having things pretty much their own way in influencing the choice of transatlantic travelers as to the ship to take.

It is true that the German ships will be confronted somewhat sooner with a pair of Italian rivals, the REX and the CONTE DI SAVOIA. While these are also to be wonder ships of not less speed, it seems that they will not actually aim to beat the BREMEN and EUROPA. They will, besides, ply to the Mediterranean, so that, while their competition is going to be felt in the Cherbourg department, these new Italian liners will not directly challenge the supremacy of the German ships on the main transatlantic highway between United States and Europe.

Modern Distributing Base for Water Transportation

THE New Orleans plant of the Lukens Steel Co., Coatesville, Pa., was recently purchased by the Jones & Laughlin Steel Corp., Pittsburgh. Acquisition of this plant will give Jones & Laughlin a large, modern steel fabricating, warehousing and distributing base at the mouth of the Mississippi river which can be served directly by river transportation from Pittsburgh, as well as by rail.

The acquisition of the Lukens plant in New Orleans is another step in the development by Jones & Laughlin of river-rail distribution on the Ohio and Mississippi rivers and their tributaries, an officer of the corporation stated. "We have been shipping to New Orleans and other southern points by river for about ten years. We are the first steel company to inaugurate this method of distribution in order to reach distant markets. In the ten years we have been engaged in river-rail distribution, we have shipped hundreds of thousands of tons of our products in tows of modern steel barges of our own construction, propelled by our own steamboats.

"The Lukens plant is an addition to our established river-rail delivery and distribution system, consisting of warehouses at Pittsburgh, Cincinnati and Memphis. These warehouses deliver our products locally as well as by rail to customers in the West, the Northwest, the South and the Southwest. In many instances our steel products are transported 1000 to 2000 miles by river and then go on by rail another 1000 miles or more. We have shipped steel in barges to customers as far into the Northwest as Minneapolis, 2000 miles by river from Pittsburgh; and as far South as Biloxi, Miss., also 2000 miles by water.

"Our river service regularly delivers to customers in Parkersburg, Cincinnati, Louisville, Evansville, St. Louis, Memphis, New Orleans, and other cities in the Ohio-Mississippi valleys. With the completion of the Intracoastal canal, between New Orleans and Corpus Christi, Tex., we anticipate being able to serve our customers in Port Arthur, Beaumont, Galveston, Houston, and other Texas cities by all-water delivery from Pittsburgh or from our warehouses in New Orleans and Memphis."

With the delivery of two new steam towboats this spring, the Jones & Laughlin river fleet will consist of 12 towboats and 250 modern steel barges, having a total carrying capacity of 200,000 tons. The larger portion of this equipment is engaged in transporting to the company's steel works and by product coke ovens in the Pittsburgh district the output of coal from its mines on the Monongahela river, which

runs as high as 5,000,000 tons a year. Another division, consisting of gondola and box barges of steel construction with water-tight compartments, is assigned to the downriver delivery service between Pittsburgh and New Orleans. Still another division is engaged in operating car ferries between the Pittsburgh works on the Monongahela river and the Aliquippa works on the Ohio, whereby freight cars loaded with steel products in process of manufacture are transferred from one works to the other, a distance of 20 miles.

Panama Mail Line to Build Four New Ships

The keel of the first of four twin-screw express liners was laid recently by the Kearny, N. J., yards of the Federal Shipbuilding and Dry Dock Co. for the Panama Mail Steamship Co. These ships, to operate between San Francisco and Los Angeles and New York, follow the award of a mail contract by the United States government to W. R. Grace & Co. of which the Panama Mail Steamship Co. is a subsidiary.

The ships will be propelled by two 6000-horsepower General Electric geared turbines, and auxiliaries will be electrified by General Electric equipment. Each vessel will have a deadweight capacity of 16,600 tons, will be 508 feet long and will have a beam of 72 feet.

Each ship will have a loaded speed of 19 knots. At sea, the supply of auxiliary electricity will normally be from two 500-kilowatt generators attached to the reduction gears of the propulsion equipment, but this electricity may also be obtained from two 500-kilowatt turbine generator sets. The latter two sets will float on the electric system when the vessel is operating at the higher speeds but, when the speed drops below 70 per cent of maximum, the turbine generator sets will automatically take over the electric load of the auxiliaries. In port, electricity will be supplied from a 200-kilowatt turbine generator set.

Heads Savannah Line

Edward R. Richardson, who has been vice president and general manager of the Ocean Steamship Co. of Savannah (Savannah line) since the release of the coastwise steamship lines from government control after the war, was elected president on June 18. He also was elected a member of the executive

committee and a director of the Central of Georgia railway. He has been connected with the line for about 30 years.

Report Shows 2,500,000 On Liners in 1930

Nearly 2,500,000 passengers, traveling on vessels flying the flags of 24 different nations, and arriving from or departing for 90 different countries or island groups, were recorded by the bureau of research, United States shipping board, in its report on water borne passenger traffic of the United States for the fiscal year 1930.

The total mentioned included 2,236,620 passengers aggregating 91 per cent, who traveled between the United States and foreign countries, 70,929 or 3 per cent on tourist cruises, 117,037 or 5 per cent who traveled to or from United States noncontiguous territories, and 21,015 or 1 per cent, who traveled through the Panama canal between the Pacific and Atlantic or Gulf ports in the United States.

The foreign passenger traffic, which represented more than nine-tenths of the entire trade, was made up of 1,177,163 arrivals at American ports and 1,059,457 departures. The passenger movement between the United States and Canada was the largest reported for any country aggregating 850,563 of which 344,140 traveled between the United States and points on the Canadian Pacific coast and 506,423 between ports of this country and ports in Atlantic Canada, and along the Great Lakes. The next heaviest movement was with the United Kingdom, including England, Scotland, Ireland and Wales, which totaled 303,782.

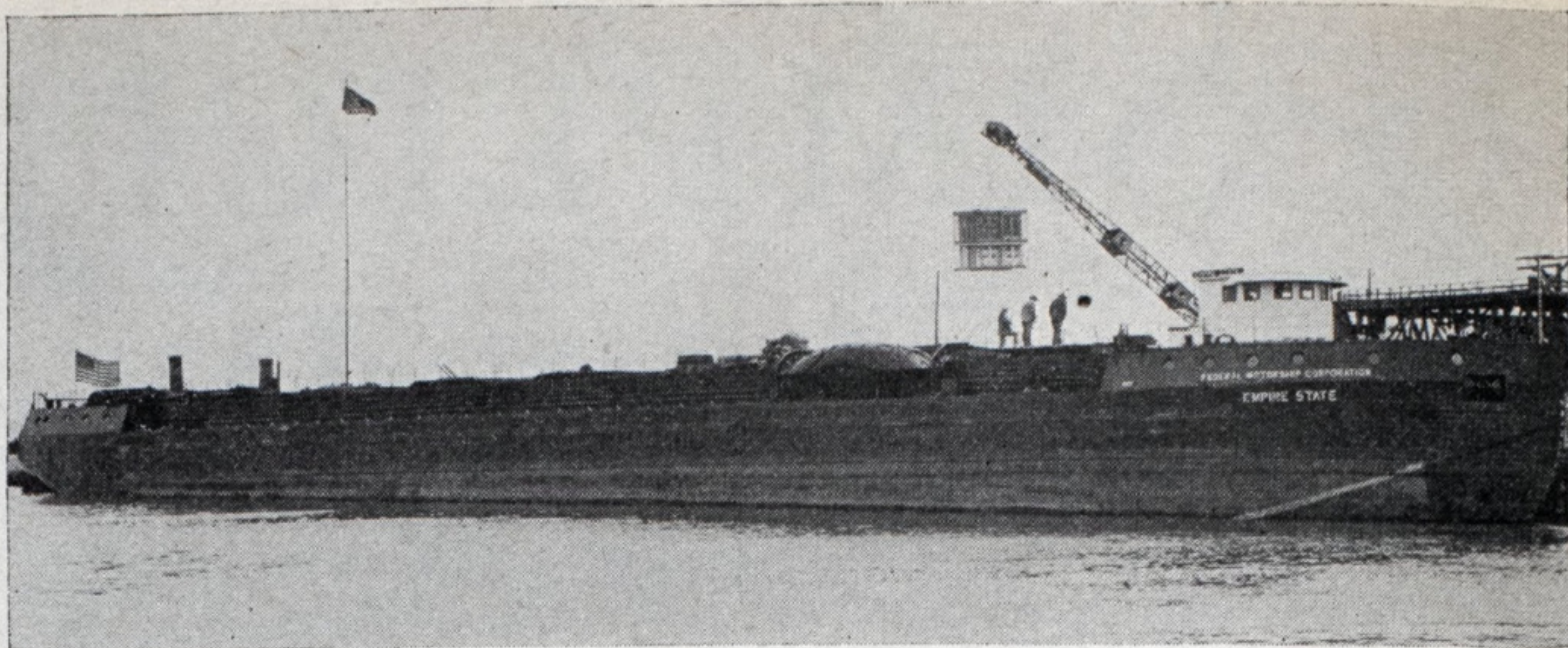
The 2,236,620 passengers recorded as arriving at or departing from United States ports during 1930, traveled on vessels registered under 24 national flags, almost 99 per cent of the total number traveling in the vessels of 10 nations. These were: Great Britain 1,054,796 passengers or 47 per cent; United States 605,416 or 27 per cent; Germany 190,446 or 9 per cent; Italy 136,848 or 6 per cent; France 94,817 or 4 per cent; Netherlands 31,868 and Sweden 30,259 or 1½ per cent, each; Japan 25,937 and Denmark 22,530 or 1 per cent each; and Norway 17,798 or ¾ of 1 per cent. The remaining 1 per cent was carried by vessels flying the flags of Belgium, Brazil, Chile, Czechoslovakia, Danzig, Greece, Honduras, Mexico, Nicaragua, Panama, Peru, Poland, Portugal and Spain.

The noncontiguous and the inter-coastal passenger trades were both conducted entirely in American flag vessels, 117,037 passengers traveling in these two movements.

All-Water Transportation for Through Shipment

SHIPMENT of cargoes by all-water transportation from the upper Lakes to salt water by way of the New York state barge canal and Hudson river is gaining more and more commercial value. This fact was borne out recently when the motorship *EMPIRE STATE* of the Federal Motorship Corp., Buffalo carried a cargo of 1800 tons from Lake Michigan to Long Island City, N. Y. Loading enameled and vitreous china plumbing fixtures, plumbers' brass and electric plants at Sheboygan, Wis., the vessel proceeded on May 4 to Milwaukee where she picked up additional cargo. She arrived in Long Island City on May 14, after having completed the 1250-mile trip through Lake Michigan, Lake Huron, Lake Erie, the Welland canal, Lake Ontario, the New York state barge canal and the Hudson river.

The motorship *EMPIRE STATE*, one of the largest vessels able to go through the barge canal, is 255 feet long, 43 feet 6 inches beam, and 20 feet depth. She is powered with two 300-horsepower Nelseco diesel engines and has a speed of 12 miles per hour. On her recent trip, she carried 1800 tons on a draft of 9 feet which is the maximum for barge canal navigation. Her cargo consisted mainly of 50 carloads of plumbing fixtures and electric plants from the Kohler Co., Kohler, Wis. This material was shipped by rail from Kohler to Sheboygan, a distance of four miles. Al-



Motorship Empire State of the Federal Motorship Corp. taking on cargo

though this company has been receiving material from England by way of the St. Lawrence river, this is the first time that it has employed the all-water route for movement of its finished products from the factory to the Atlantic seaboard.

Issue Report on American Intercoastal Traffic

The water borne intercoastal freight traffic of the United States for the calendar year ended Dec. 31, 1930, amounted to 9,043,772 cargo tons, according to a report of the United States shipping board, bureau of research.

This commerce was carried on entirely in American flag vessels operating through the Panama canal between Pacific, Atlantic and Gulf coasts.

More than 72 per cent of the entire volume of intercoastal traffic originated on the Pacific coast and moved east-

ward through the canal. Of this eastbound traffic amounting to 6,502,267 tons, 429,661 tons or 6½ per cent was delivered at ports in the Gulf, 121,544 tons or 2 per cent at ports on the South Atlantic coast, and 5,951,062 tons or 91½ per cent at North Atlantic ports. Of the westbound traffic amounting to 2,541,505 tons, 564,589 tons or 22½ per cent originated at Gulf ports, 48,535 tons or 2 per cent at South Atlantic ports, and 1,928,381 tons or 75½ per cent at North Atlantic ports.

Cutless rubber bearings manufactured by the B. F. Goodrich Co. Akron, O., are being installed in the following craft; Two 7-inch bearings in each of two new 130-foot fireboats for the City of New York, now under construction by the Todd Shipyard & Drydock Co., New York; Four bearings, two 8¾-inch and two 8⅞ inch, in the ferryboat *SAN DIEGO*, now being built by the Moore Drydock Co. for the San Diego & Coronado Ferry Co.

What the British Are Doing in Shipbuilding

THE total output of the Scottish shipyards in May was some 32,500 tons gross. The Clyde total of 31,600 was considerably below the average for May, contrasting with over 53,000 tons last year and 45,000 in May 1929. For the five months of this year 34 vessels have been launched with a total tonnage of 93,000 tons.

* * *

A NEW all-electric passenger vessel the construction of which is regarded as a triumph of British engineering was demonstrated to a party of 150 shipowners, shipbuilders and engineers when the vessel *LOCH FYNE* specially designed for service on the west coast of Scotland completed her trial. She is equipped with two 1000 h.p. Paxman heavy oil fuel engines driving Metro Vick generators which supply not only the power for driving the vessel but also the electricity for the auxiliary machinery. The engines are fitted with superchargers and the

space thus set free is available for extra passenger and cargo accommodation. The vessel is controlled direct from either side of the bridge instead of by the usual method of relayed control. The power of maneuvering due to instant response to control is almost unparalleled. The vessel has been built by William Denny & Brothers Ltd. of Dumbarton for David MacBrayne (1928) Ltd. of Glasgow. The main contractors for the machinery were David Packman & Co. Ltd. Colchester, the whole of the electric gear being supplied by the Metropolitan Vickers Electrical Co. Ltd. of Manchester.

* * *

THE Furness Shipbuilding Co. of Haverton Hill who in recent years have built many special tankers have just launched the *BRITAMOIL* being the first of two vessels for the British American Oil Co. Ltd. When launched the ship was in a completely finished

condition except for her propelling machinery and has been constructed in the remarkably short time of 13 weeks. It is 250 feet long, 43 feet wide and 18 feet deep with a dead weight of 2800 tons. Engines are to be supplied by the North Eastern Marine Engineering Co. Ltd. and consist of triple expansion engines with multi-tubular marine type boilers.

* * *

A DEARTH of orders on Teeside prevails and it is stated that with the exception of a small pontoon no berths are occupied. Shipbuilders in that area are interested in important negotiations pending for new steamers of a cross-channel type. Definite inquiries are in hand for anything up to five new vessels and while some are likely to be built on the Tyne one or more may be ordered from shipbuilding yards on the northeast coast. The situation on Teeside, however, is without parallel in shipbuilding.

Reviews of Late Books

Ship Management and Operation, by Hobart S. Perry, Ph. D., assistant professor of commerce and transportation, University of Pennsylvania; Cloth, 310 pages, 6 x 9 inches; published by Simmons-Boardman Publishing Co., New York, and supplied by MARINE REVIEW, Cleveland, for \$4 plus 15 cents postage and in Europe by the Penton Publishing Co., Ltd., Caxton House, London, for 20s, postage extra.

This book is based upon a course in ship management and operation given by the author, enlarged and supplemented by latest available statistical data. Most of the material is new, having been obtained by original research and includes information seldom given out by shipping officials.

The organization of a shipping company's operating department is described in detail. The duties and activities of the various branches are explained with the most important work of each branch given special emphasis.

The three other parts of the book deal with shipping personnel administration, types of vessels in relation to their cargoes and the power problem of ships, covering types of engines now in most general use.

This book will appeal particularly to the younger members of shipping companies seeking to orient themselves in the industry and find roads to advancement. Business men and others who are interested in the successful operation of American shipping will find in it a clear description of modern methods used in its management. It is also suitable as a text for college courses on marine transportation. Libraries can place it on their reference shelves, as it affords a comprehensive survey of the present stage of development of the American merchant marine.

Scoop Circulation, by Lieut. Comdr. H. Allen Gosnell, U. S. N. R., cloth, 69 pages, 5 x 8 inches, published by Simmons-Boardman Publishing Co., New York, and supplied by MARINE REVIEW, Cleveland, for \$2.50 plus 15 cents postage and in Europe by the Penton Publishing Co., Ltd., Caxton House, London, for 12s 6d net.

This volume is the first book dealing with a subject which is of growing interest to naval architects and others concerned with the installation of improved engine room equipment. During his 14 years commission in the United States naval reserve the author has specialized on engineering problems and the book is the result of a study undertaken because of the lack of any formulated knowledge on scoop circulation and the influence of scoops on condensing equipment. It is a subject receiving considerable attention in

naval circles and is being considered for application to passenger and cargo ships.

The book is based upon original materials. The design of the scoop itself has been largely a matter of "cut and try." These data were obtained from specific designs for various types of vessels extending over a period of years. The effect of scoop circulation upon various pieces of condensing equipment is dealt with at length.

In order to make the subject complete it is carried all the way through to the feed and filter tank. In the case of the units little affected by the employment of scoops, brief attention is given to the requirements of marine equipment as against that used ashore. The book contains illustrations of various evacuating units as well as photographs of naval vessels of the types using scoop circulation. The author also presents descriptions of two typical scoop installations including their condensing and evacuating equipment.

Port and Terminal Charges at United States Ports, by Corps of Engineers, United States Army, and Bureau of Operations, United States Shipping Board, 1931 edition; paper, 635 pages, 6 x 9 inches; copies supplied by Superintendent of Documents, Government Printing Office, Washington, at \$1.25 per copy.

The wide scope of this book, issued annually, and the detailed way in which the subject is treated make it a standard book or reference for those in the shipping world who require authentic information regarding port dues and charges throughout the United States.

Among other subjects covered in the volume are pilotage, towage, dockage, harbor dues, port warden's fees, fuel, stevedore and labor charges, wharfage, handling, storage, and other services and charges at individual ports with summarized information regarding the physical features and commerce.

Volume is divided into two parts. Part 1 contains information regarding the charges of the United States government and the more important governmental regulations affecting the movement of vessels, freight and passengers, these regulations generally being the same for all ports. Part 2 contains information in detail regarding charges and services at the individual ports, following a standard arrangement of subjects.

The United States Shipping Board—Service Monographs of the United States Government No. 63, by Darrell Hevenor Smith and Paul V. Betters; cloth, 338 pages, 5½ x 8½ inches;

published by The Brookings Institution, Washington, D. C.; price \$2.50.

This book is one of a series of monographs prepared by the Institute for Government Research giving a detailed description of each of the distinct services of the government. These monographs are all prepared according to a uniform plan. They give: First, the history of the establishment and development of the service; second, its functions, described not in general terms, but by detailing its specific activities; third, its organization for the handling of these activities; fourth, the character of its plant; fifth, a compilation of, or reference to, the laws and regulations governing its operations; sixth, financial statements showing its appropriations, expenditures and other data for a period of years; and, finally, a full bibliography of the sources of information, official and private, bearing on the service and its operations.

These monographs are wholly descriptive in character and serve the double purpose of furnishing an essential tool for efficient legislation, administration and popular control and of laying the basis for critical and constructive work on the part of those upon whom responsibility for such work primarily rests.

Daily Metal Trade Standard Steel Price Extras, by Penton Publishing Co., Cleveland, edited by Walter S. Doxsey, editor *Daily Metal Trade*, second edition, revised and enlarged, 7½ x 5¼ inches, paper, price \$1 postpaid.

The standard differentials selected for this handbook are used generally by leading producers of iron and steel in pricing mill products and the book is a handy reference for all users of steel, purchasing agents, estimators, salesmen and sales executives. It was formerly known as *The Differential Handbook to Standard Steel Price Extras*.

The Ports of San Diego and San Luis Obispo, Calif. Part 2 port Series No. 13, by board of engineers for rivers and harbors of the war department and the bureau of operations, United States shipping board, paper, 6 x 9 inches; copies upon request, Board of Engineers for Rivers and Harbors, 2848 Munitions building, Washington.

The report contains full information regarding port and harbor conditions, port customs and regulations, services and charges, fuel and supplies; facilities available for service to commerce and shipping, including piers, wharves, grain elevators, storage warehouses, bulk freight storage, marine railways, marine repair plants, coal and oil bunkering facilities, floating equipment, wrecking and salvage equipment; railroad and steamship lines, and their charges and practices in connection with terminal service. Maps are presented showing the location of the principal facilities at the ports.

New Trade Publications

TERMINAL FACILITIES—A booklet outlining its terminal facilities has been issued by the Portland Terminal Co., Portland, Me. A map and airplane view of the harbor are included as well as a number of other illustrations.

WIRE ROPE—A folder on Korodless wire rope has been issued by the Hazard Wire Rope Co., Wilkes-Barre, Pa. The resisting qualities of this rope to corrosion, whether acids, alkalis or destructive fumes, are emphasized. The rope is made from chrome nickel alloy steel.

REGULATORS—The Spence Engineering Co., New York, has issued a new catalog on its various types of pressure and temperature regulators, valves, and strainers. The booklet contains many illustrations and drawings as well as specifications.

SKID SYSTEM OF HANDLING—The Elwell-Parker Electric Co., Cleveland, has issued an interesting catalog under the title of "Handling and Shipping on Skids." A number of excellent illustrations show various types of skids in operation and details of performance are given.

CONDULETS AND COUPLINGS—In its Bulletin 2218 the Crouse-Hinds Co., Syracuse, N. Y., describes its line of threadless condulets, couplings and connectors for rigid conduit and electrical metallic tubing. The bulletin contains many illustrations and listings and is a supplement to Catalog 2200.

PUMPS—Worthington Pump & Machinery Corp., Harrison, N. J., has issued four recent bulletins, as follows: Vertical four-cylinder, direct-injection diesel engines, Bulletin S-500-B5; horizontal duplex piston pumps, specification sheet W-112-S6 and S9; vertical triplex single-acting power pumps, D-423-S9.

REFRIGERATION—Bulletin No. 510, recently issued by the Brunswick-Kroeschell Co., New Brunswick, N. J., is devoted to the Carrier B-K cold diffusing system. Positive air circulation and temperature uniformity are stressed and a complete description is given of the various parts of the system. Illustrations and line drawings also are given.

GENERATOR UNITS—A new catalog on small generator units and their application has been issued by the Wes-

tinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Four different types of generators used where a small amount of electrical energy is necessary but where no central station supply is available are described with information regarding applications.

CONSTRUCTION COSTS—A report prepared by the special risk and engineering department of the Hartford Accident & Indemnity Co., Hartford, Conn. under the title *Cutting Construction Costs* deals with the importance of accident prevention work. The booklet is carefully planned and carried out and should prove helpful to all executives interested in the prevention of accidents.

STANDARDS YEAR BOOK—The approval of 46 new industrial standards including many important projects in mechanical, electrical, civil, mining and chemical engineering, is announced in the American Standards Year Book for 1931 recently published by the American Standards association, 29 West 39th street, New York. Many important methods of test for petroleum products and lubricants are also included.

GAS REGULATION—A new catalog recently issued by Natural Gas Equipment Inc., Petroleum Securities building, Los Angeles, is devoted to automatic pressure regulation for gas, steam, liquids or vapors. The booklet contains a wealth of reference material, information on new equipment just developed, blue printed installation charts as well as camera studies of unique installations. Copies upon request.

REFRIGERATION SAFETY—*The American Standard Safety Code for Mechanical Refrigeration*, recently issued by the American Standards association gives a brief history of the development of the code, personnel etc. The code was developed through the American Standards association and under the leadership of the American Society of Refrigerating Engineers. It was approved by the Association in October 1930.

RECORDING INSTRUMENTS—The 1931 edition of the Tycos power plant catalog issued by the Taylor Instrument Companies, Rochester, N. Y., illustrates all of the Tycos instruments used in steam power plants. Included

in the catalog are industrial thermometers, recorders, pressure and vacuum gauges and regulators for temperature and pressure. A diagrammatic layout shows the application of these instruments throughout the power plant.

PUMPS—Worthington Pump & Machinery Corp., Harrison, N. J., has issued several bulletins, as follows: Specification sheet W-112-S10, on horizontal duplex piston pattern oil pumps; specification sheet W-423-E8, on vertical triplex single-acting power pumps; specification sheet W-112-S11, on horizontal duplex piston pattern heavy pressure hot oil pumps; specification sheet W-200-S10, on surface condenser, patented folded tube layer type.

PROPELLER FANS—In its catalog No. 385 the B. F. Sturtevant Co., Hyde Park, Boston, covers its new line of propeller fans. These fans are made of pressed steel throughout with parts welded, producing a very light weight and strong fan and frame. Advanced features of construction described include the wheel, ring, motor mount, motor and mounting panel. The catalog is illustrated and will be sent to anyone upon request.

INDICATORS—Alexander McNab, First National Bank building, Bridgeport, Conn., has issued a number of bulletins on the McNab concentration indicator, direction and revolution indicators, propeller shaft clearance indicator, mechanical engine counter, revolution counters and logometers, propeller shaft lubrication, self-draining whistle valve, whistle controls and Hopkinson-Thring torsionmeters. The bulletins are all illustrated and contain descriptions of the various devices.

VENTILATORS—Catalog No. 377 of the B. F. Sturtevant Co., Hyde Park, Boston, is devoted to a detailed description of its new flexible unit ventilator and its function in solving ventilating problems. Three standard arrangements of this ventilator are covered, the non-recirculating type, the 100 per cent recirculating type and the partial recirculating type. Numerous illustrations and drawings as well as specifications are included. The catalog will be furnished to anyone upon request.

BOILER WATER CONDITIONING—A booklet on the conditioning of boiler water has been prepared by the Elgin Softener Corp., Elgin, Ill. It discusses various problems in treatment of water for boilers. It is illustrated to show various types of scale, sludge, corrosion, pitting and embrittlement, gravity and pressure feeds for control. The application is described of sludge deconcentrators to various types of boilers and schematic arrangements of deconcentrator and heat exchanger.

Business News for the Marine Trade

The Arrow Engineering & Scaling Corp., Hoboken, N. J., was chartered under the laws of New Jersey on May 9 to engage in marine repair work. Joseph L. O'Connell, Manhasset, L. I., N. Y., is connected with the new company.

The Plarus lines, with monthly sailings scheduled to begin May 28 by the steamer KROGH leaving Baltimore, will conduct a regular cargo service between St. John, N. B., and Baltimore. Fortnightly sailings are planned for a later date, steamers on this run making the trip in five days.

The Cynthia Corp. of Norfolk has been chartered under the laws of Virginia with authorized maximum capital of \$50,000 to conduct the business of owning and operating ships and vessels of all kinds. Officers are: F. T. Bray,

president and treasurer; B. P. Moon, vice president, and F. P. Bray, secretary, all of Norfolk.

The shipyard of B. F. Wood, Inc., at City Island, New York, which was closed about two years ago by members to enter the aviation field, has been reopened under the management of Harry Hild. A new group headed by C. R. Benton has spent about \$25,000 on equipment and in repairing the plant, and plans to engage in construction of yachts up to 100 feet in length and in repair work up to 250 tons. The name of the old company will be retained. Mr. Benton has been named president and treasurer of the company and J. E. Packer and Kenneth Chisholm vice president and secretary respectively.

Announcement was made on May 8

that the International Derrick & Equipment Co. and the Stacey Engineering Co., which operates the P. H. & F. M. Roots Co. and the Connersville Blower Co. had merged forming a new company to be known as the International Stacey Corp. with headquarters in Columbus, O. Colonel Carmi A. Thompson, Cleveland, is chairman of the board of directors.

Macneil Instrument Corp. has been organized under the laws of the state of New York, to manufacture and sell the Macneil all weather sextant as exclusive licensee under the patents pending of Paul H. Macneil, the inventor, who is associated with the corporation as technical director. A limited number of instruments will be available in about 90 days, to be followed soon by increased production.

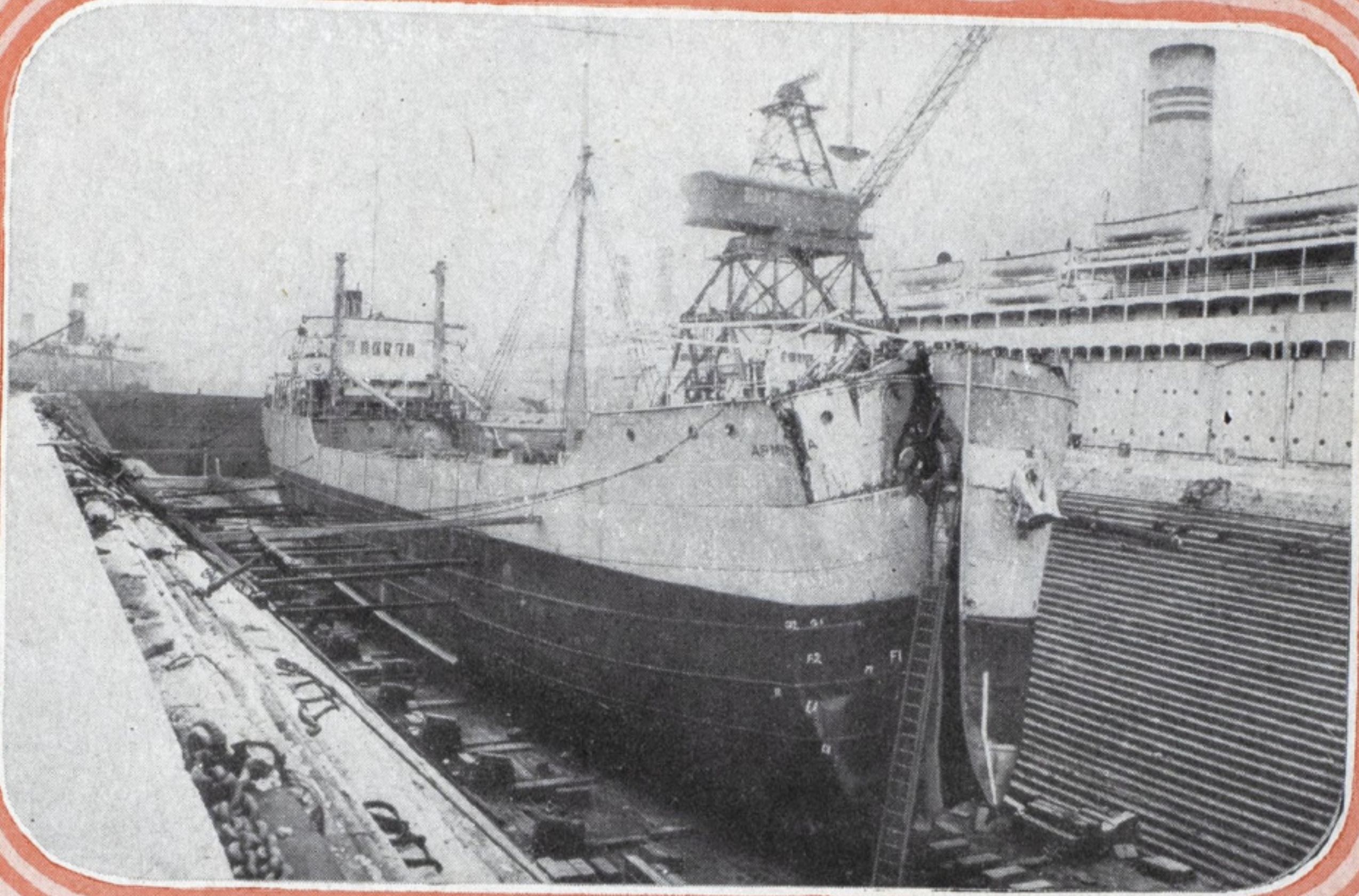
Marine Review

Reg.
U.S.
Pat.
Off.

*The National Publication Covering the Business of
Transportation by Water*

July, 1931

*Hedger Transportation Company's
S. S. "Arminda" on No. 2 Graving
Dock, Robins Plant of Todd Ship-
yards Corporation, Erie Basin,
Brooklyn, N. Y., following colli-
sion to her bow.*



TODD Organization

Stands Behind TODD Service...

The single purpose of the Todd Organization is the maintenance of a dependable nation-wide Service, on all coastlines of the United States, for important owners and operators demanding an exceptional quality of marine engineering service in the conversion, repair and reconditioning of transoceanic and coastwise vessels.

The wide experience of Todd Service, coupled with unexcelled equipment for every phase of marine reconstructional work characterizes the activities of this Organization as preeminent in the marine industrial field.

24 Floating Dry Docks • 2 Graving Docks • 3 Shipways
Todd Unit System of Burning Pulverized Fuel
Todd Fuel Oil Burning Systems

PLANTS

Robins Dry Dock & Repair Co.
Erie Basin, Brooklyn, N. Y.

Todd Dry Dock Engineering &
Repair Corporation
Brooklyn, N. Y.

Tietjen & Lang Dry Dock Co.
Hoboken, N. J.

Todd Shipbuilding & Dry Dock
Company, Inc., Mobile, Ala.

Todd Engineering Dry Dock &
Repair Company, Inc.
New Orleans, La.

Todd Dry Docks, Inc.
Harbor Island, Seattle, Wash.

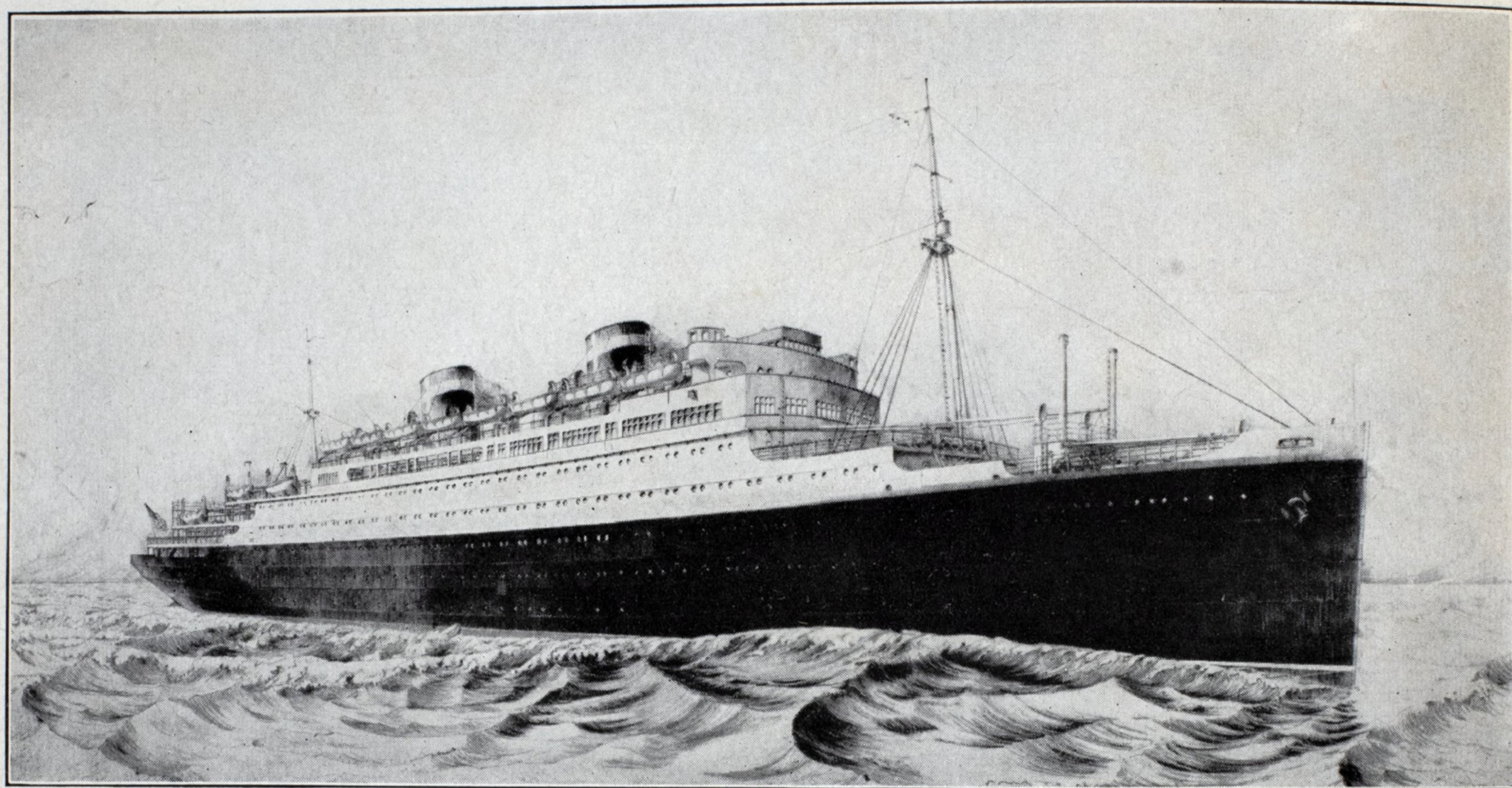
Todd Oil Burners, Ltd.
London, England

**LARGEST
DRY DOCK**
in **NEW YORK
HARBOR**



TODD SHIPYARDS CORPORATION, 25 Broadway, New York

America must become shipminded



Largest American-built merchant ship now under construction for the United States Lines at the yard of the New York Shipbuilding Company.

AN American Merchant Marine is an important factor in the prosperity of every section of our country and in the welfare of every citizen.

If foreign nations control the world's deepwater tonnage in times of stress or national emergency our markets are limited to their will.

The people of our chief shipping competitors know the vital need of

ships and are willing to make such sacrifice as may be necessary to have a merchant marine. They insist that the goods they import must be carried in the ships of their flag and they see to it that the goods they export are carried in these same vessels.

When American Citizens Develop a Loyalty for their own Ships, the Problem of our Merchant Marine will be largely Solved.

NEW YORK SHIPBUILDING COMPANY

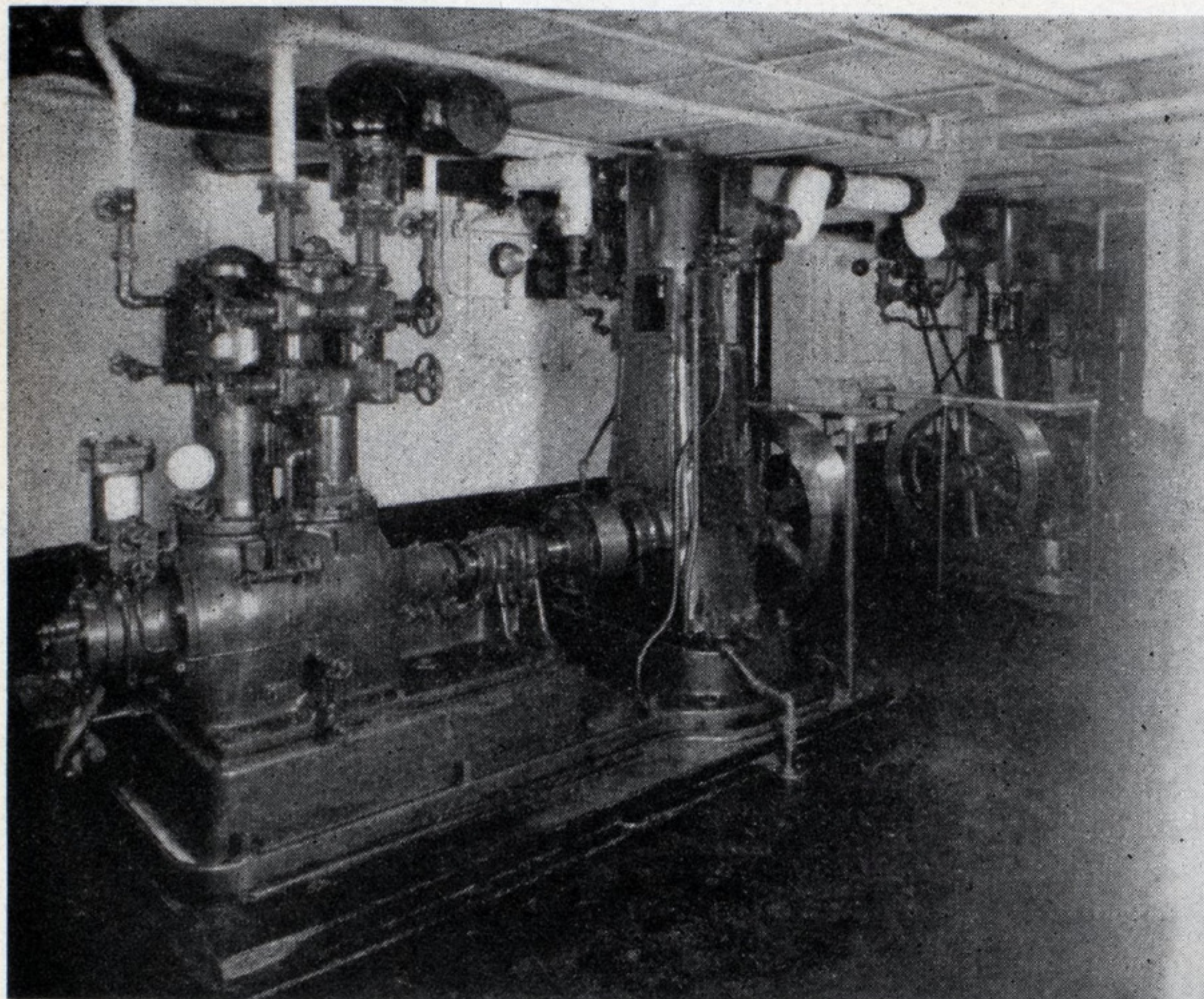
Main Office and Works:
CAMDEN, N. J.

New York Office:
420 LEXINGTON AVE.

Steam Engine Drive

THAT MEETS EVERY MARINE REQUIREMENT

Many owners of both small and large vessels have cut operating cost of compressor, fan, pump and generator drive by using Engberg marine engines.



Compressors on the steamships Agwidale and Alamo, both of the Clyde Mallory Line, are driven by Engberg Marine Engines.

A Few More of the Many Users:

Goodrich Transit Corporation
Campbell Creek Coal Company
Pittsburgh Steamship Company
Ohio River Sand Company
Standard Transportation Company
Chesapeake & Ohio Railroad
United States Government
Interlake Steamship Company
Eastern Steamship Lines
Ford Motor Company

Low cost reliable service is the natural result of design and construction based on forty years successful analysis, building and operating engines in marine service. Engberg Marine Engines are fully enclosed, entirely self-oiling, operate without oil leakage and with or without cylinder lubrication. The new watershed prevents emulsification by keeping condensation out of the oil. Generous bearings and working parts, liberal use of chrome nickel steel, simple adjustments and a proven lubricating system guarantee long life. These and many other features are fully described in new Descriptive Bulletin. Send for a copy. Remember the specification of Engberg Marine Engines assures you low cost dependable drive.

TROY ENGINE AND MACHINE COMPANY

2242 RAILROAD AVENUE

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TROY, PENNSYLVANIA

« »

U. S. A.

TROY - ENGBERG

Horizontal and Vertical Steam Engines « » Generating Sets « » Generators « » Switchboards

The proof of the pudding . . .



“THE proof of the pudding is in the eating,” so the saying goes. By the same token we must look to performance for the proof of lubricating oil quality in effecting economical operation.

When Gargoyle Marine Oils enable the new *Empress of Britain* to set a new world's record for low fuel consumption with .57 lbs. per s.h.p. per hour—there's more than a suggestion of unusual cost-cutting lubrication.

When 65% of the world's Diesel-driven ships rely on Gargoyle Marine Oils, there's more than a hint of substantial savings in repair and replacement charges.

When successive speed queens—*Mauretania*, *Bremen*, *Europa*—shatter records with Gargoyle Marine Oils, there's a strong indication of minimum friction and maximum horsepower.

The Vacuum Oil Company has specialized in scientific lubrication for 65 years. Such experience *does* produce better lubricants, *made to fit* the needs of your engine. These facts prove it.

Representatives of the Vacuum Oil Company in more than 300 of the world's leading ports are ready to serve you. The next time one of them comes aboard ask him about lower engine-room costs.

In the meantime we will be glad to send you either of these helpful books, without obligation: “*Steamships with Reciprocating Engines*” or “*Marine Lubrication—Motorships*.” Address: Vacuum Oil Company, Marine Sales Dept. D-7, 61 Broadway, New York.



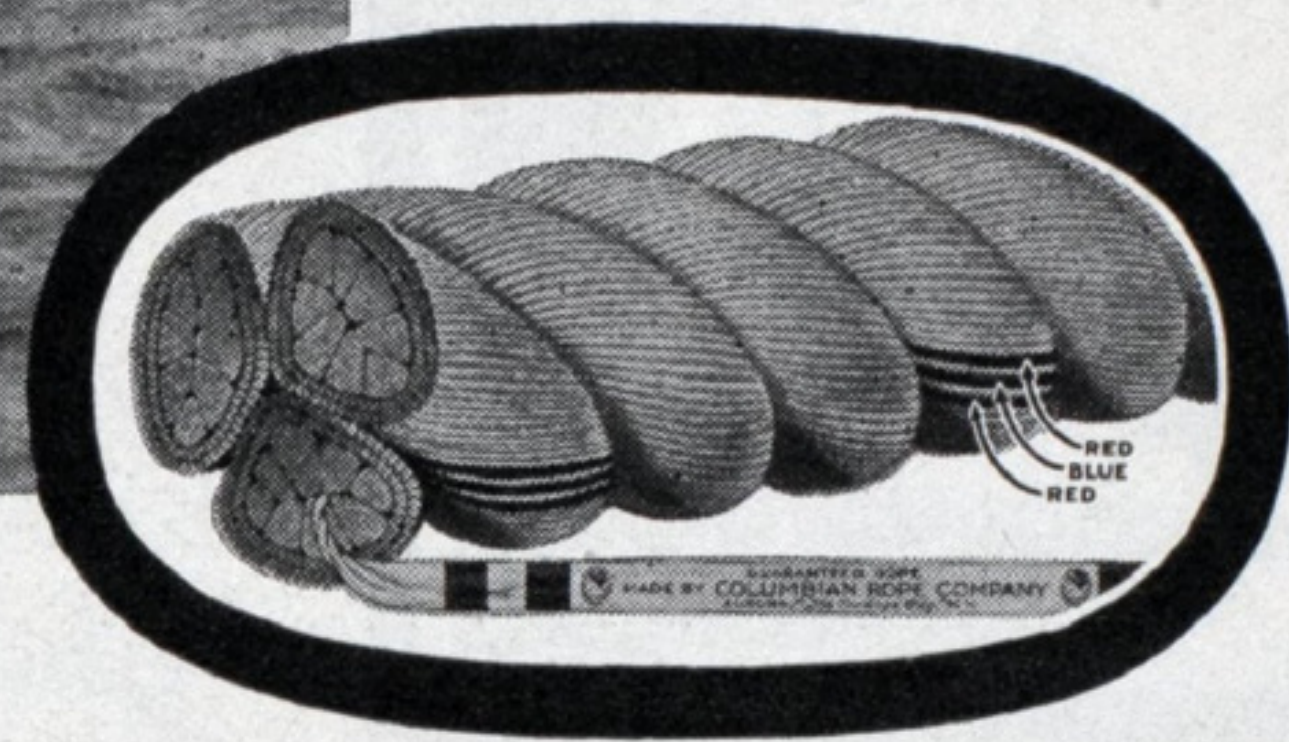
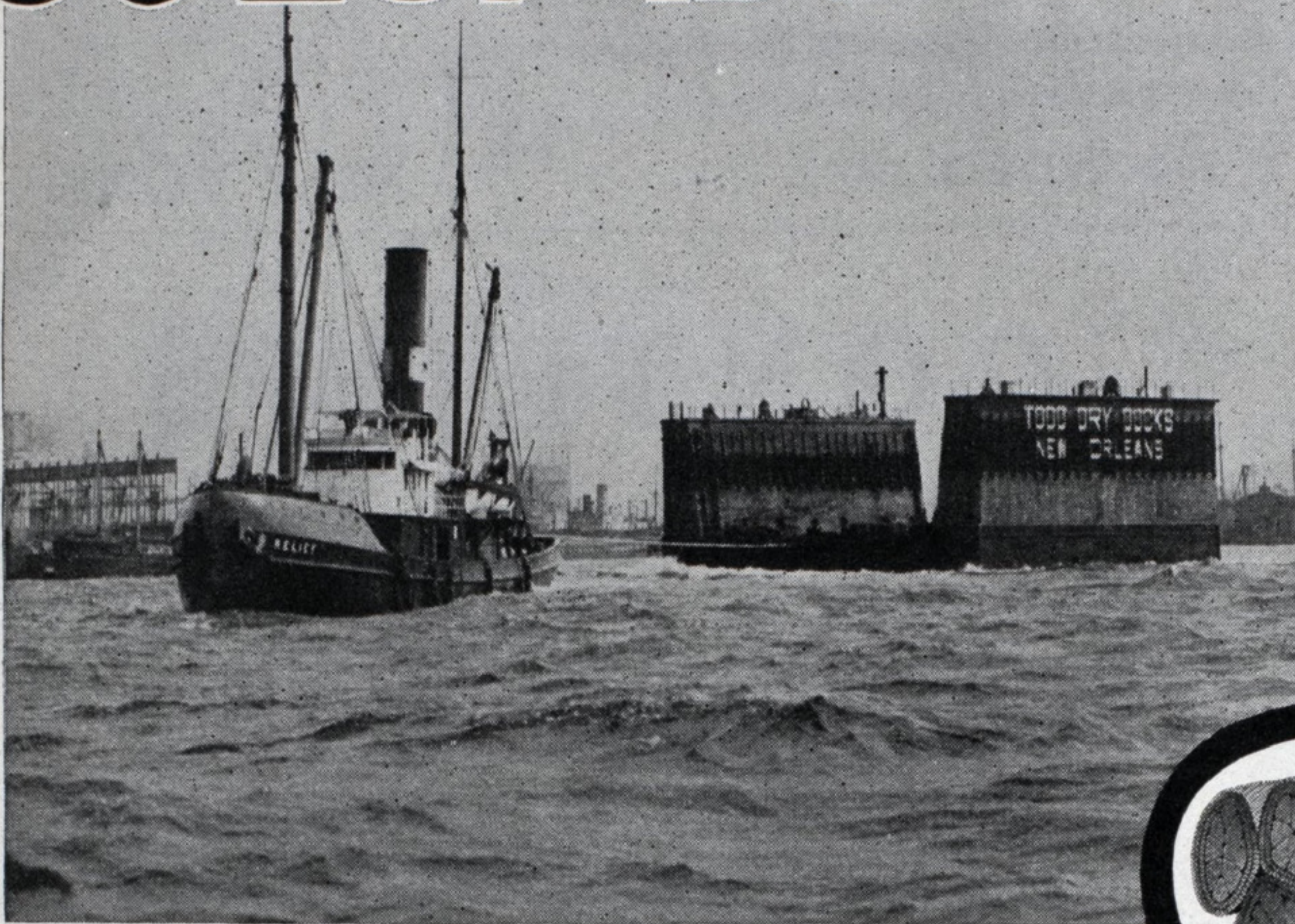
Marine Oils

A grade for each
type of service

VACUUM OIL COMPANY

COLUMBIAN TOW-RO

PATENTED



MORE TOWING MILES PER DOLLAR

It's a fact. Columbian Manila Tow-Ro, with its new patented construction gives more service for your money than you can obtain in any other brand of towing line.

Look at this example of service given by a Columbian Line:

Several months ago, a 2,000 ton drydock section was towed from New York to New Orleans, a distance of 1,800 miles. The towing line was Columbian. This line has been used almost constantly since and in March it was called upon to repeat the New York to New Orleans tow with another 2,000 ton section.

Although heavy seas were encountered on both tows, the Columbian Line functioned perfectly. The towing company reports this line is in "splendid condition and good for much more service."

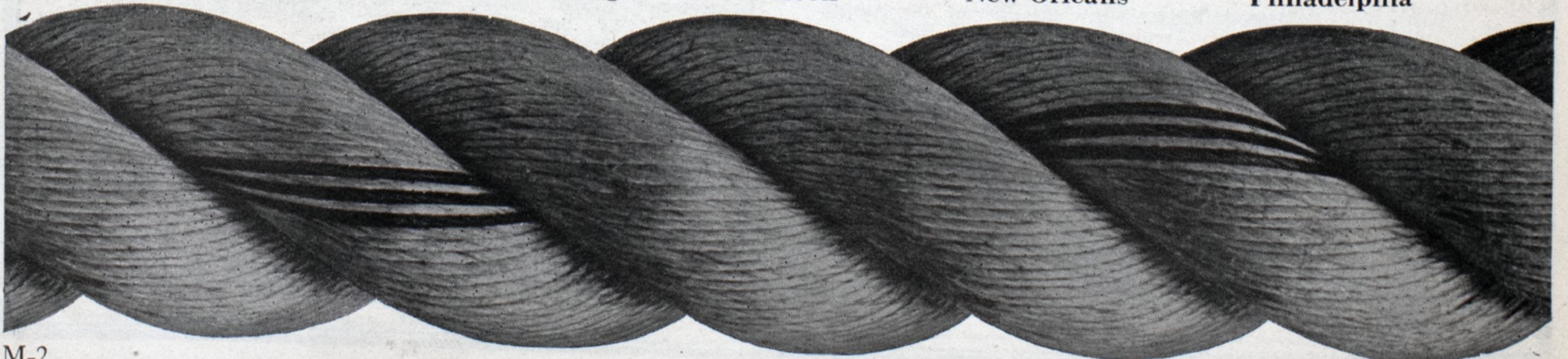
There is no question that Columbian Tow-Ro is the greatest value in a towing line, because it is faithfully giving more towing miles per dollar. And that's what counts.

COLUMBIAN ROPE COMPANY

342-90 Genesee Street

Auburn, N. Y. "The Cordage City"

Branches: New York Chicago Boston New Orleans Philadelphia

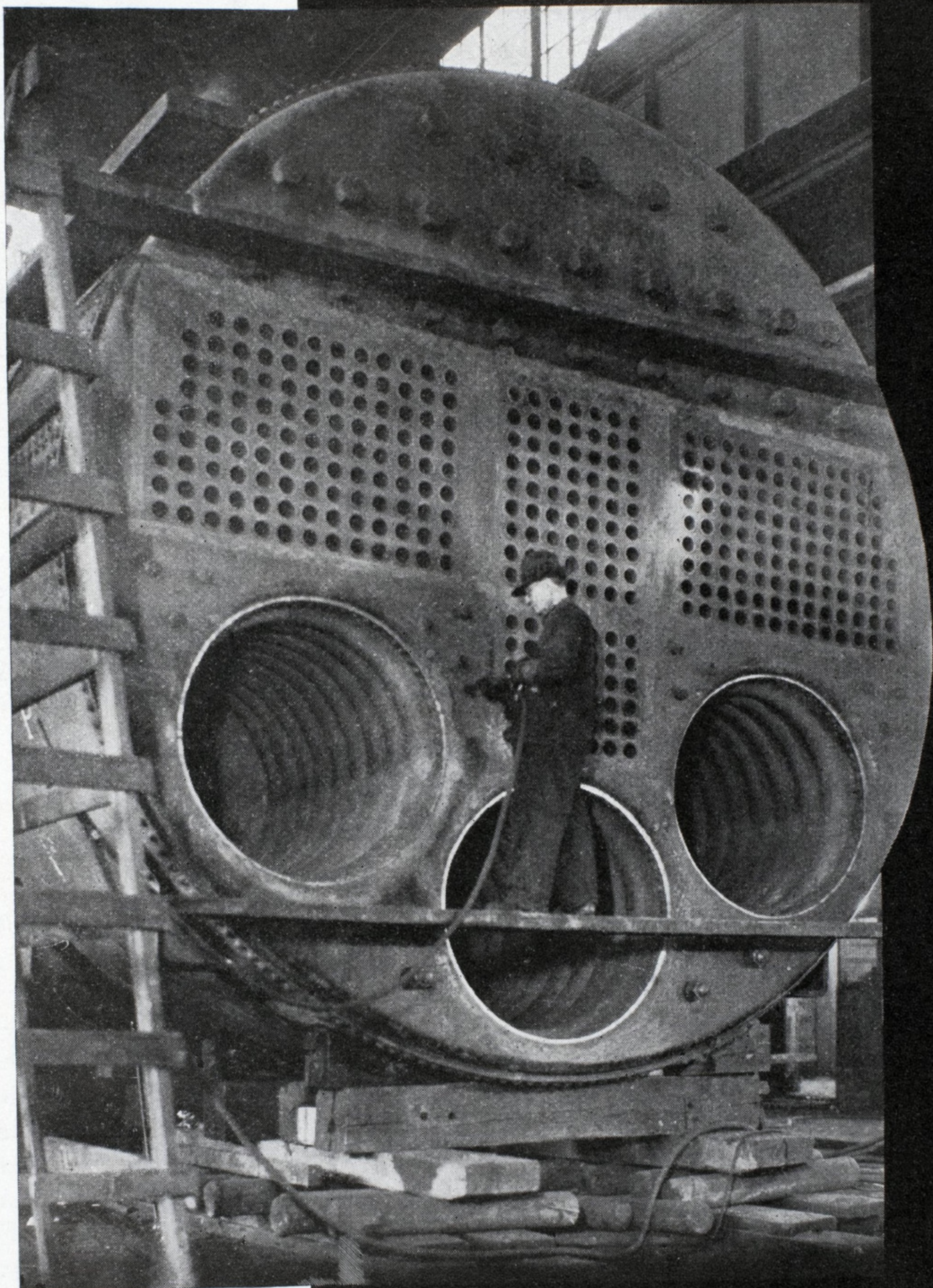


Get Those Improvements Out of Your Mind And Into Your Ships!

● It is clearly sound business judgment to have those ship repairs or alterations, which you have planned to have us make for you sometime, made by us *now*!

Many ships are still in winter berths as we write. A good time for repairs—no interference with traffic; or loss of precious cargo hauling opportunity. Materials are now lower in price. Labor does a better job, quicker. Surely it is good business to take advantage of this opportunity.

A little job left too long often becomes a *big* job. Let your repairs or alterations be made swiftly, dependably, economically, at one of American's five completely equipped ship yards *now*! Obey that impulse!



The AMERICAN SHIP BUILDING CO.



CLEVELAND
American Ship
Building Co.

LORAIN
American Ship
Building Co.

BUFFALO
Buffalo Dry Dock
Company

SOUTH CHICAGO
Chicago Ship
Building Co.

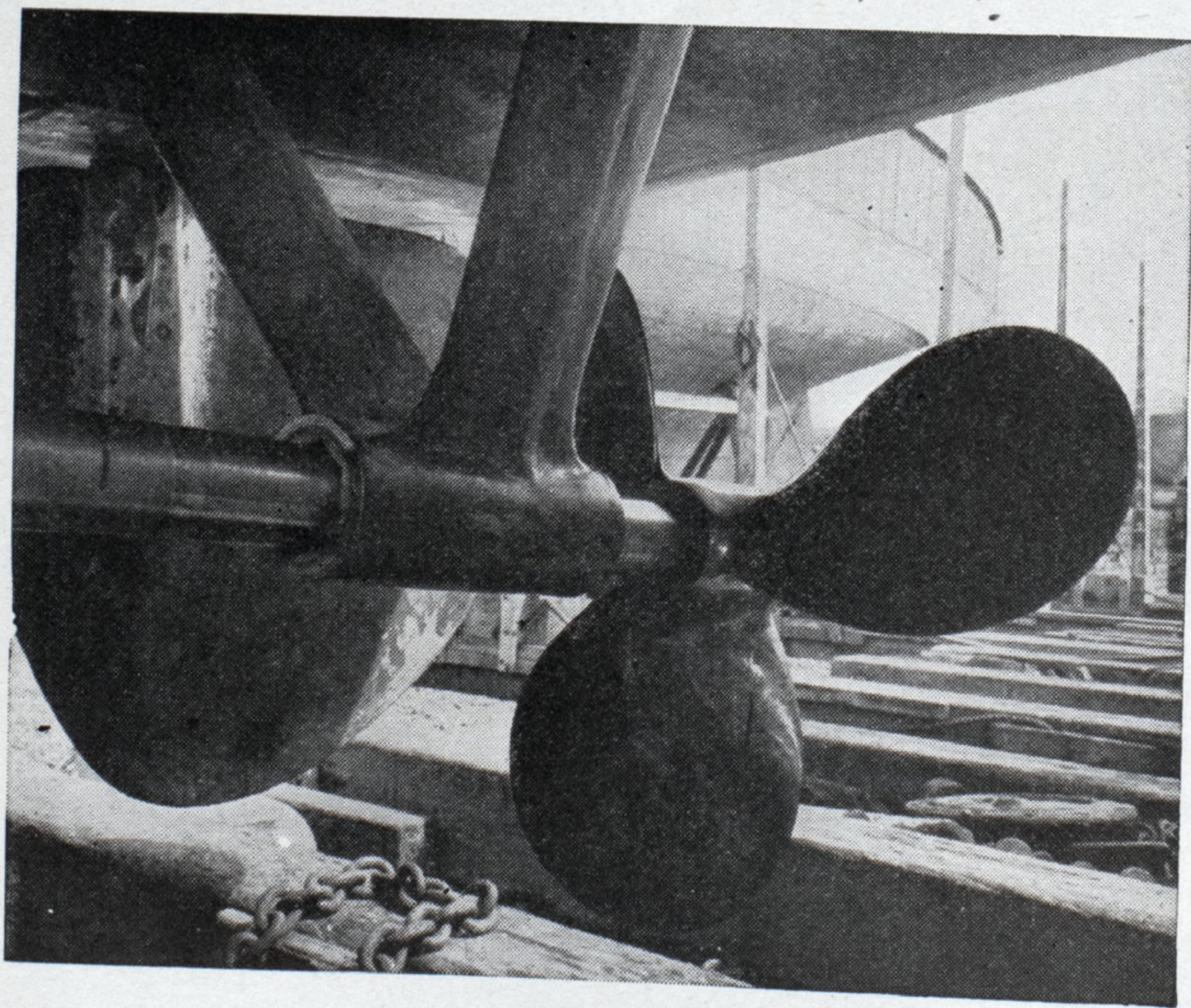
SUPERIOR
Superior Ship-
building Co.



Southern Pacific's

*Golden Gate Ferries
set new service
records with these*

soft rub
that far



*Photo shows typical Cutless Bearing installation.
Special grooves insure ejection of all sand and grit,
thereby greatly increasing life of bearing and shaft.*

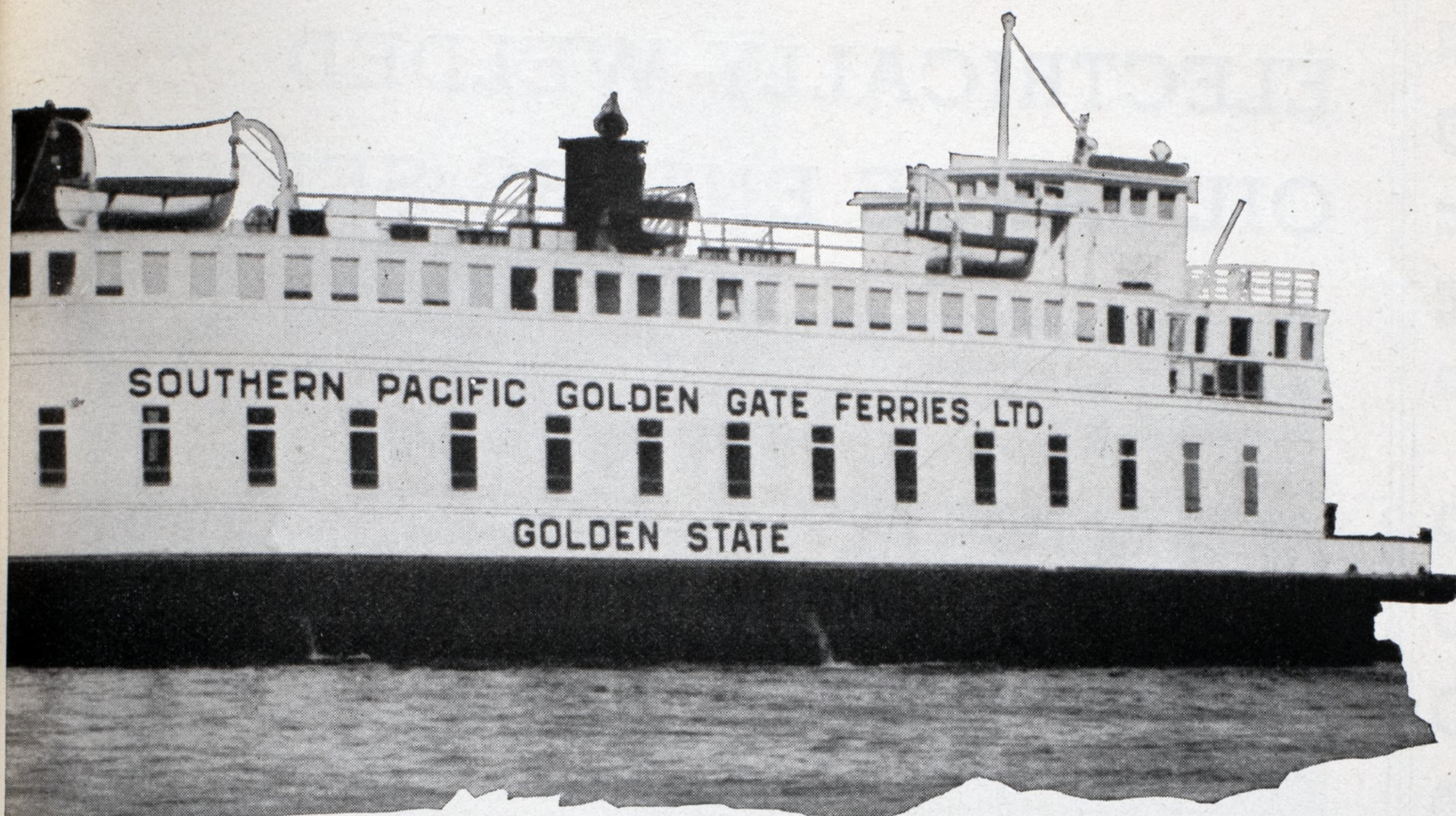
CONTINUOUS service...heavy service...for the last four years. That's the unusual record of Golden Gate's electric ferries on San Francisco Bay.

Each has run an average of 243,550 miles. Each has effected notable economies in upkeep...economies in which their Goodrich Cutless Bearings play a vital part.

Freedom from propeller-shaft pounding...elimination of untimely bearing renewals...that's what these soft rubber bearings mean to Southern Pacific.

That's precisely what they can mean to you. For these bearings outperform,

Goodrich



ber bearings

outlast all other types...

outlast hard-surface types—often by as much as ten to one.

Radically new in principle

What makes them so superior? It's a new, exclusive Goodrich development—a metal sleeve lined with *rubber*—rubber that is grooved to assure free passage of the lubricating water over the entire bearing surface.

When wet, the metal shaft turns smoothly, freely—like a smooth rubber tire spinning on a wet car track. Wear from friction is negligible.

The rubber is tough...abrasion-resist-

ing...sand and grit cannot wear it down. This sediment is pressed into the rubber, rolled into the grooves, then washed away. Bearings remain uncut, shafts unscored. Vibration is checked at its source.

Make your own comparison

The records these bearings have made in many types of heavy craft are outstanding. Send for further details, then check them with the performance your present bearings give. Write for catalog 731-C, to The B. F. Goodrich Rubber Co. (Est. 1870), Akron, Ohio.



Goodrich Cutless Bearings are available for both strut and stern...for craft of every type and size. Quickly installed.

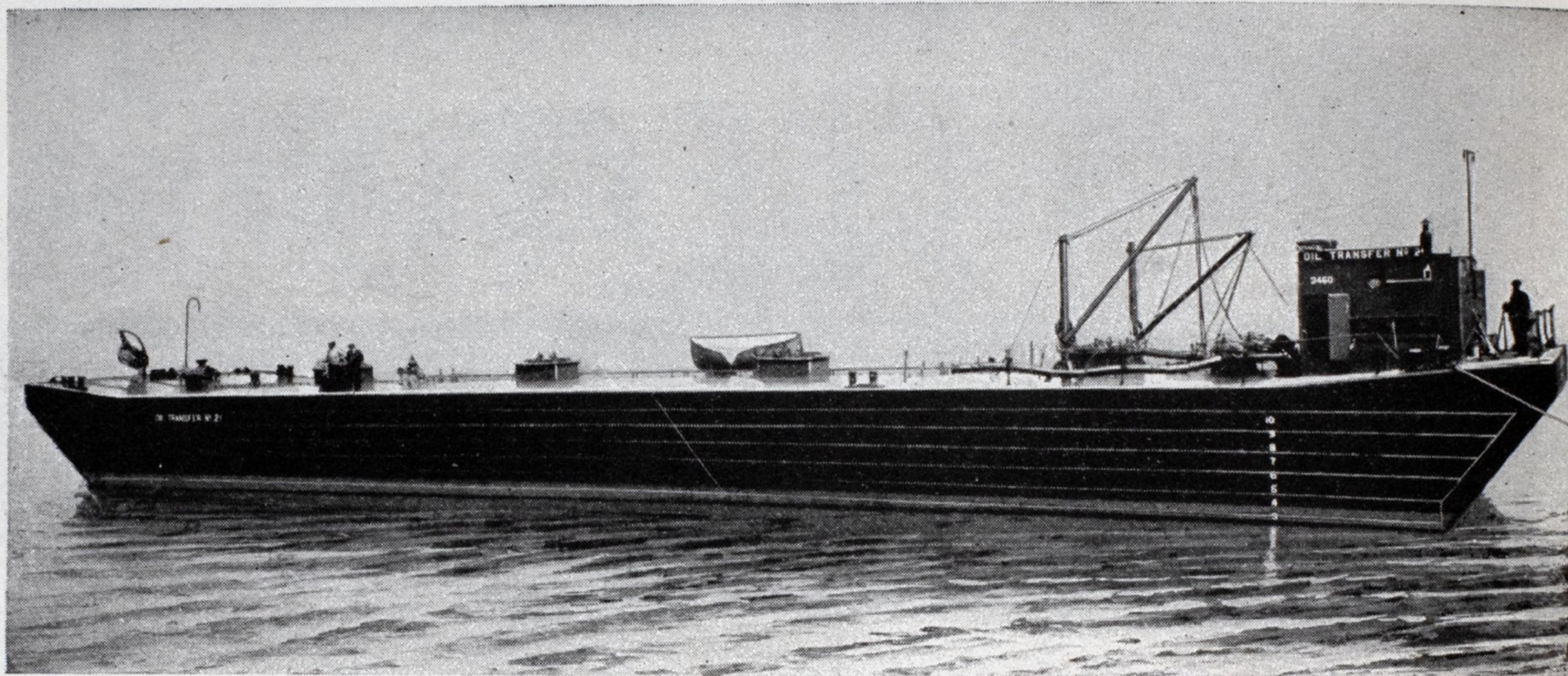
Cutless Bearings



Another B. F. Goodrich Product

MARINE REVIEW—July, 1931

ANOTHER ELECTRICALLY WELDED OIL BARGE ENTERS SERVICE



View of the 10,000 bbl. welded oil barge of the Oil Transfer Co. of New York, recently completed by the Federal Shipbuilding and Dry Dock Co. This is the FOURTH welded barge of Federal design built for this Oil Company. All have been in continuous service, the first since April, 1929.

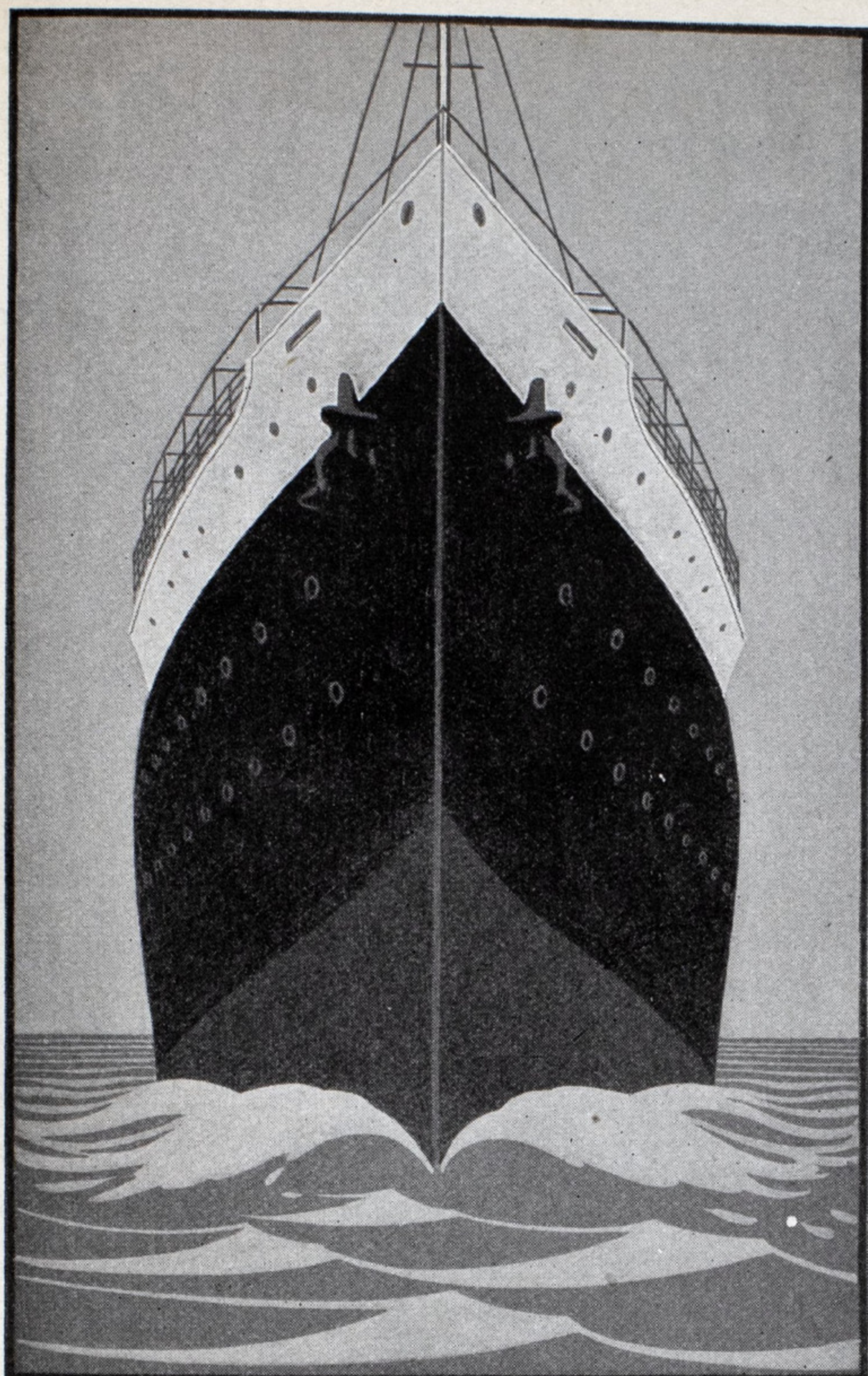
Welded barges of Federal design have given satisfaction in operation, and demonstrated their superiority over the riveted type. No rivets to become loosened through damage or affected by corrosion...tight joints obtained without caulking or packing...welding performed by automatic machinery and tested operators, resulting in uniform workmanship.



FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
GENERAL OFFICES AND WORKS: LINCOLN HIGHWAY, KEARNY, NEW JERSEY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

MARINE REVIEW—July, 1931



THE ELECTRIC SHIP COMES IN

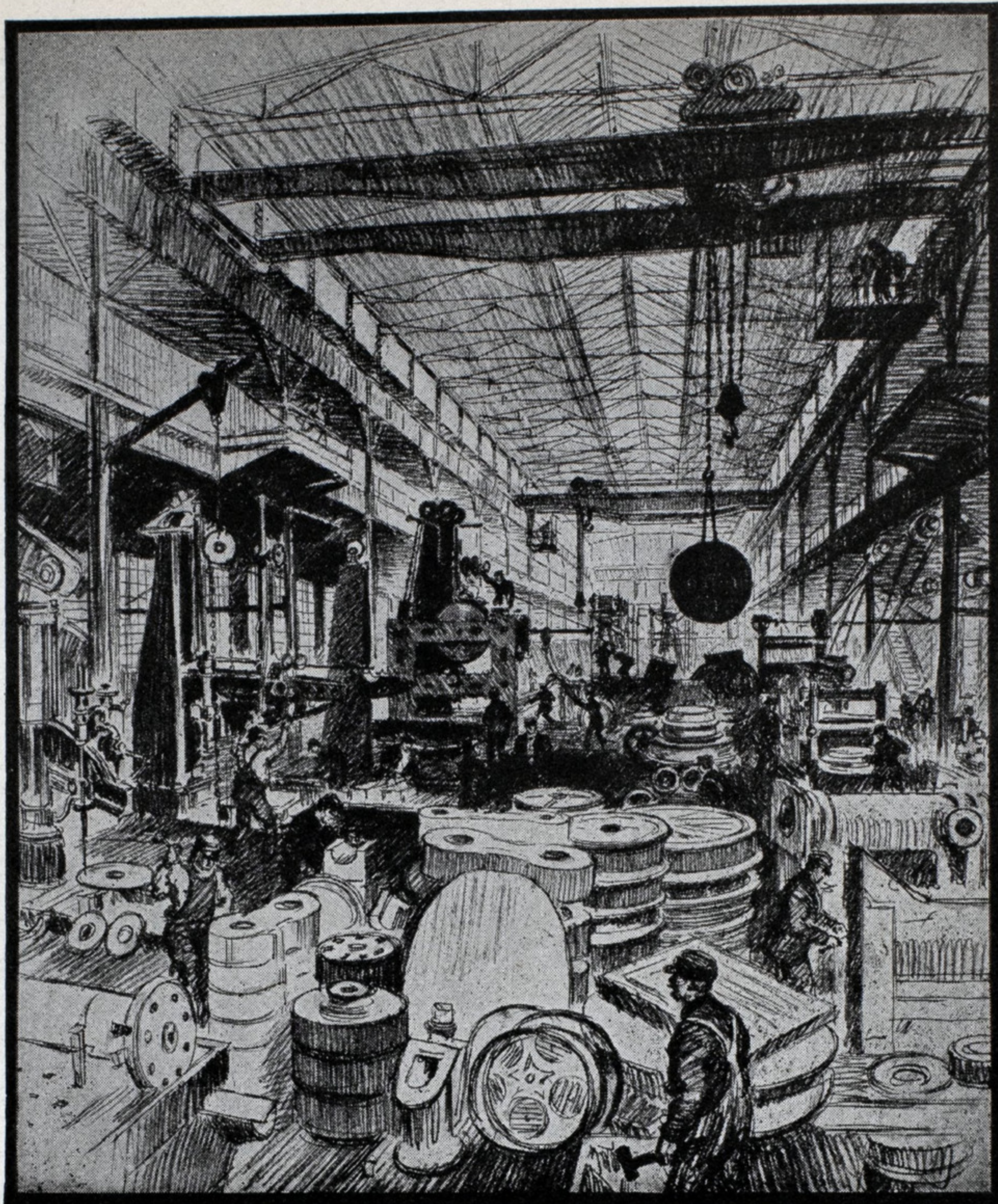
Electricity, the great industrial modernizer, has now put to sea and has brought to ocean travel all the advantages of high speed, great economy, and reliable operation. • Progressive

lines are awakening to the fact that electric propulsion is a highly salable asset—that the new demand for greater comfort at sea is setting old standards aside—that the public is now seeking, in addition to transportation, that highway smoothness and vibrationless speed that can be enjoyed with electric drive. • General Electric marine engineers have long cooperated in furnishing turbine-electric propulsion. Their practical experience is at your service whether your needs call for turbine-gear, turbine-electric, or Diesel-electric drive, or electric equipment for ships' auxiliaries. • These engineers will be glad to show you the economic advantages that invariably follow in the wake of a change to modern, progressive types of propulsion.

JOIN US IN THE GENERAL ELECTRIC PROGRAM,
BROADCAST EVERY SATURDAY EVENING ON A
NATION-WIDE N.B.C. NETWORK

GENERAL  ELECTRIC
MARINE
EQUIPMENT

173-9



*Machine shop at Rivard Street, Detroit
where we build and repair engines*

HIGHEST STANDARDS

of workmanship, engineering and
service are ever apparent in
Great Lakes built ships and en-
gines—and repairs.

GREAT LAKES ENGINEERING WORKS

Shipbuilders and Engineers

General Offices

River Rouge, Michigan

Cleveland Office: Union Trust Bldg.

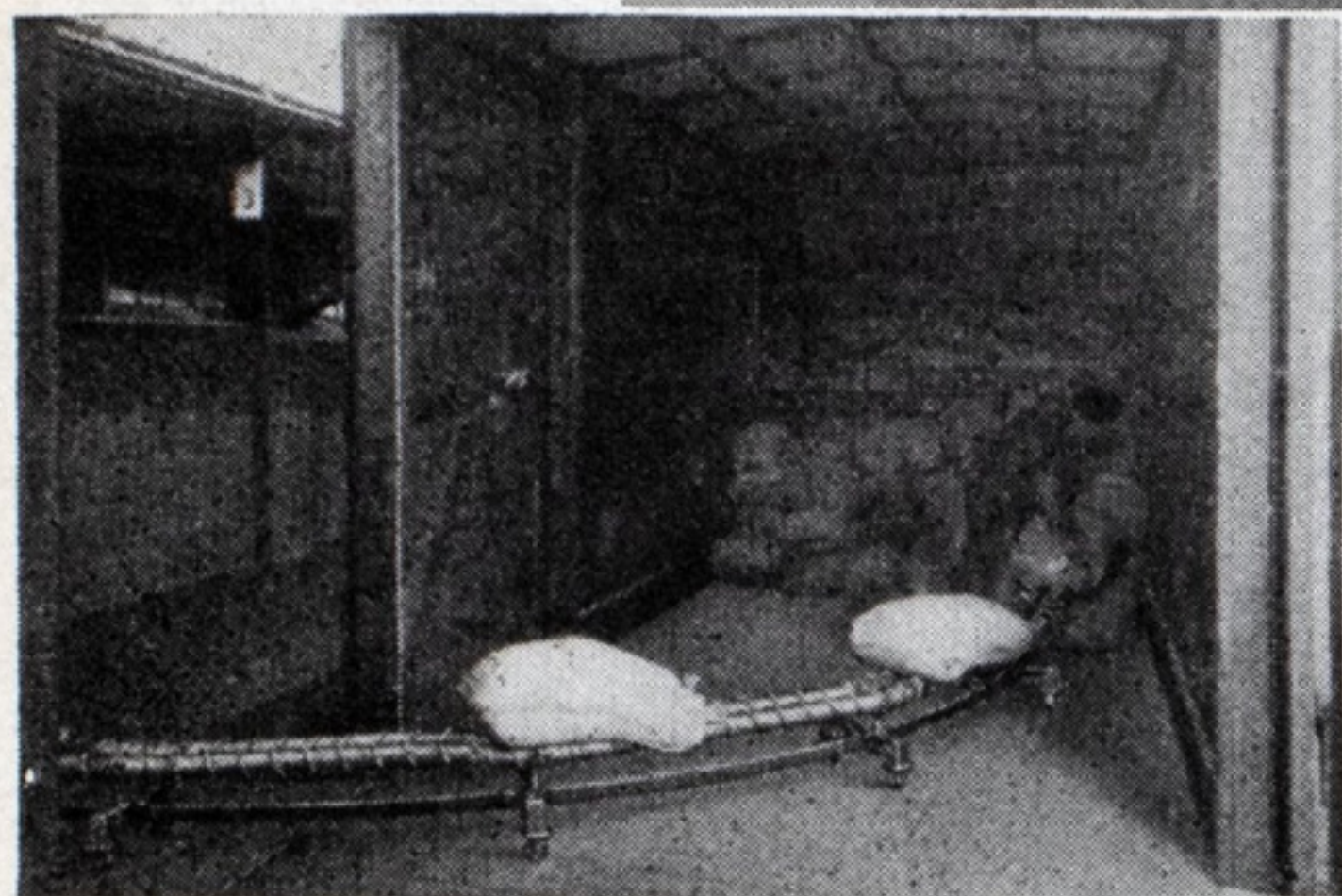
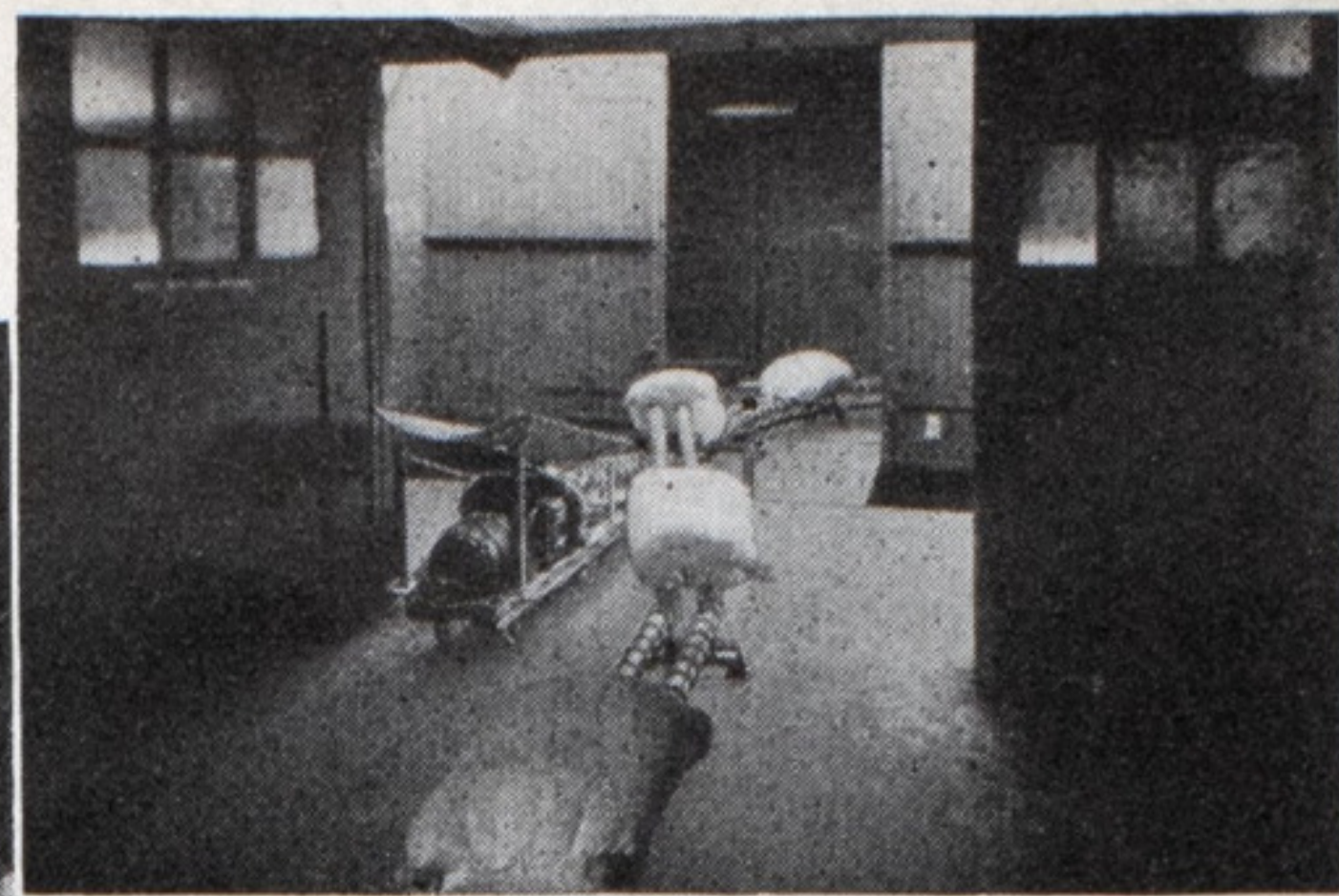
*Engine Works Equipped
For General Heavy
Machine and Foundry
Work*

Detroit, Michigan

*Complete Shipbuilding
Dry Dock and Repair
Facilities*

*River Rouge, Mich., and
Ashtabula, Ohio*

"Clark Kar Kit" takes cargo from "TwinVeyor" or other conveyor system and flicks it into 'tween-deck space or into freight car.



Feeds bags to far end of car — a one man loading operation.

Cargo delivery from ship to warehouse. "Clark Kar Kit" feeding a standard "TwinVeyor" line.

"CLARK KAR KIT"

Flexible as a snake's tail

Here is the most important advance made in cargo handling equipment in 20 years. It achieves definite cost reduction in getting freight from car to ship, ship to car or from ship to warehouse.

It is a self-contained conveyor unit mounted on casters, can be bent left or right, is easily moved about even when operating. It consists of six 4 ft. dual sections of Clark "TwinVeyor" — parallel spiral tubes constantly turned toward each other by a power head.

In unloading operations, it takes cargo in bags, bales, bundles and similar packages from the pile or from conveyor system on board, carries it swiftly out the side port

and delivers it automatically to conveyor system on dock or in warehouse. Capacity, thirty 100 lb. bags per minute — one-man operation. Bags travel 90 ft. per minute.

In loading, "Kar Kit" takes bags from chutes or conveyor and whisks them on at unprecedented speed. One man can easily move the "Kar Kit" around. It never tires, never lags, keeps right on running, carrying steadily and rapidly anything given to it.

"Clark Kar Kit" will cut the time in port — will swell net operating income. Write for folder illustrating its many applications.

The Clark Trutractor Co.

Battle Creek, Mich.

Attach this
ADVERTISEMENT
to your inquiry

Speed cargo handling

**A ship earns money at sea
—not at the wharf**

SAVE IN PRODUCTION COST with better material-handling

Electric Industrial Trucks equipped with Exide-Ironclad Batteries save money

IN the handling of material, industry to-day has a great opportunity to reduce production costs and increase net profits. This can be accomplished by using electric industrial trucks equipped with Exide-Ironclad Batteries.

Electric industrial trucks move material with speed, efficiency and economy. When

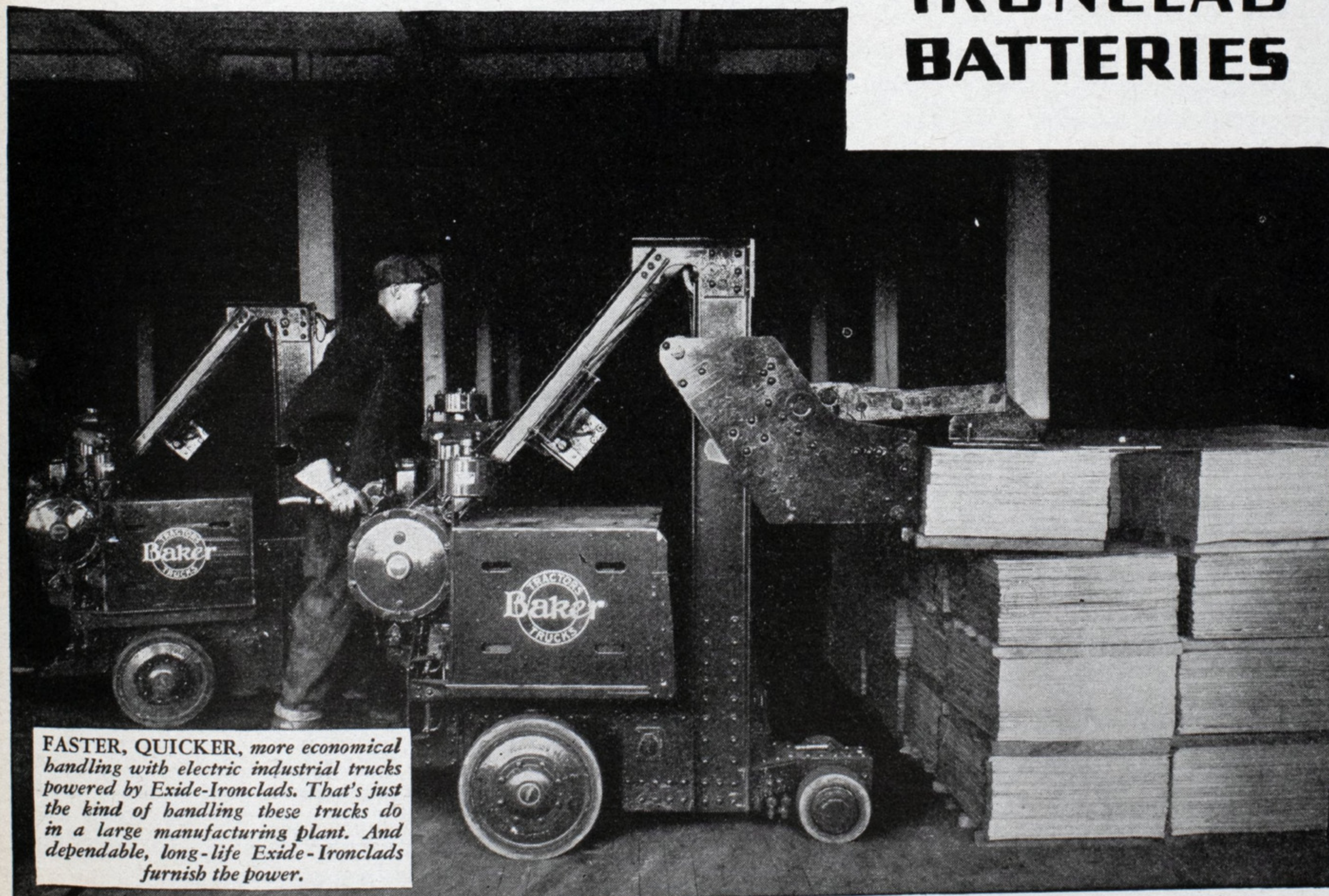
powered with Exide-Ironclad Batteries they not only maintain a good speed throughout the entire day's operation, but do it at the lowest possible cost.

Exide-Ironclad Batteries are entirely different from all others. Their rugged construction, the result of 43 years of specialized manufacturing experience, enables them to deliver years of day-in and day-out service with minimum care and attention. They are long-lived, powerful, and economical at the charging panel.

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... in Elwell-Parkers means

Low Maintenance Costs



THE outward simplicity and clean design of every Elwell-Parker truck reflect the inward simplicity of construction—a simplicity that produces unusual strength and at the same time low maintenance costs.

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All wheels are mounted on oversize roller or ball bearings, so that drive shafts with universal joints may be drawn through the wheels.

The lift jack is held in position by four bolts, so that by removing these bolts the whole unit can be taken out bodily.

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Brake shoes are easily relined. The shoes, which surround surface-ground, drop-forged drums, are

readily lifted out by removing two nuts. Relining then becomes a simple matter.

On tiering trucks and cranes the simplest type of winch and cable is used.

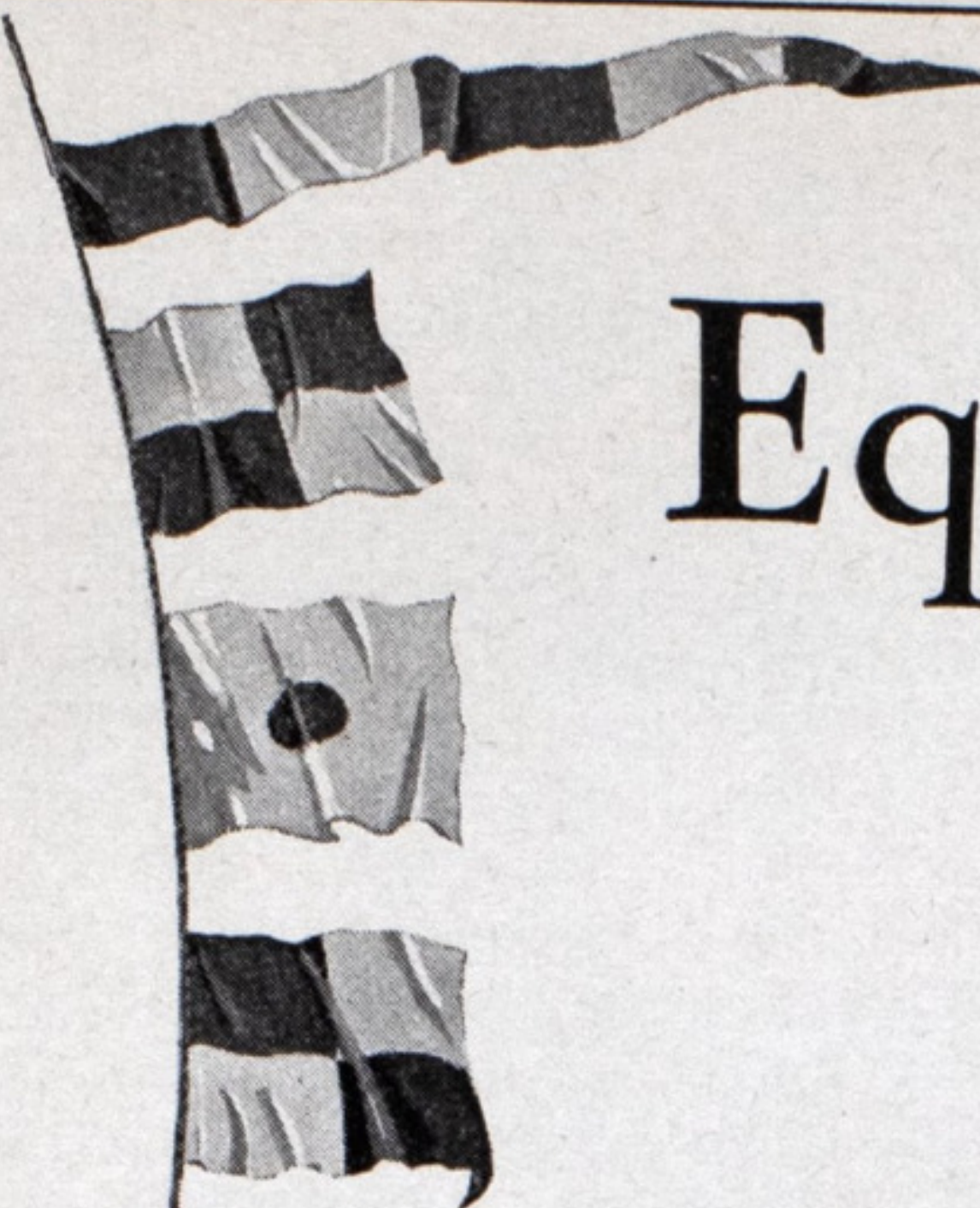
Batteries are placed so as to be easily removed by sliding out of the battery compartment at either side, or by lifting out of the top. Complete attention has been given to simplicity of operation, with full vision for the operator of the load and conditions ahead when traveling in either direction. All operating controls are placed in easily reached, natural positions.

Elwell-Parker simplicity means lower operating cost, lower maintenance charges, a longer period of service and therefore a greater return on your electric truck investment. The one way to make sure you get all Elwell-Parker advantages, including interchangeability of parts between types, is to specify *Elwell-Parker* as the make of truck you buy.

Write for informative booklets—Elwell-Parker is constantly producing new information on handling materials. Send your name and the kind of materials you handle to make sure that you are informed of the most recent developments. Write The Elwell-Parker Electric Company, 4200 St. Clair Avenue, Cleveland, Ohio.

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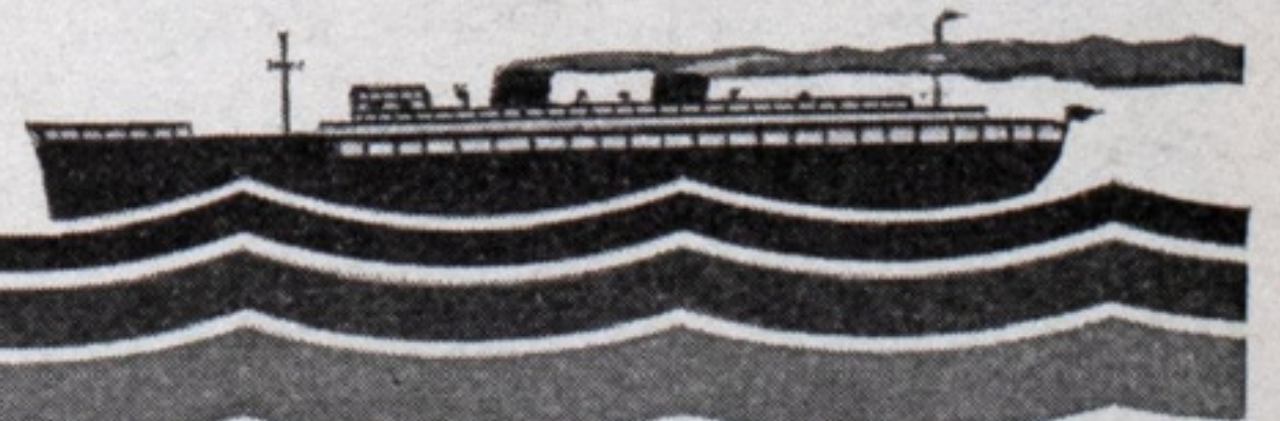
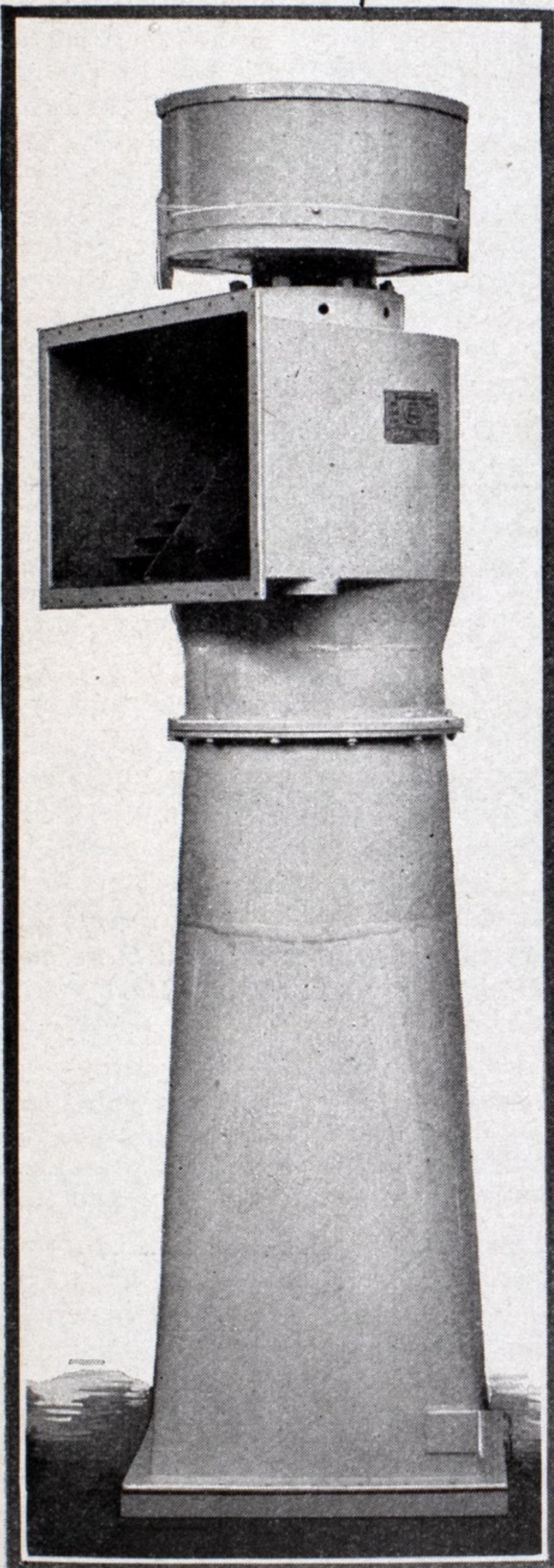
LIGHTWEIGHT machinery in a passenger or freight carrying vessel increases the percentage of total displacement available for passengers or cargo. In a tugboat it increases the fuel capacity and makes possible a longer cruising radius. In these types of vessels, therefore, a saving in machinery weights means greater potential earning power.

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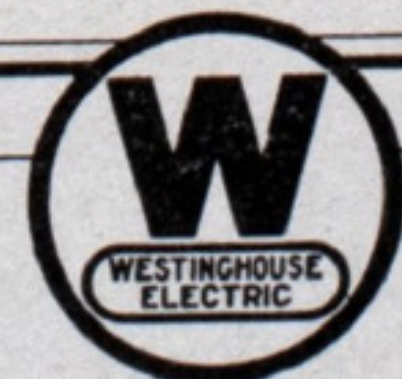
balance, absence of high-pitched noise, and extremely small space and low weight characteristics make it the logical blower for all types of vessels. Exhaustive tests by the United States Navy have definitely proved its superior efficiency.

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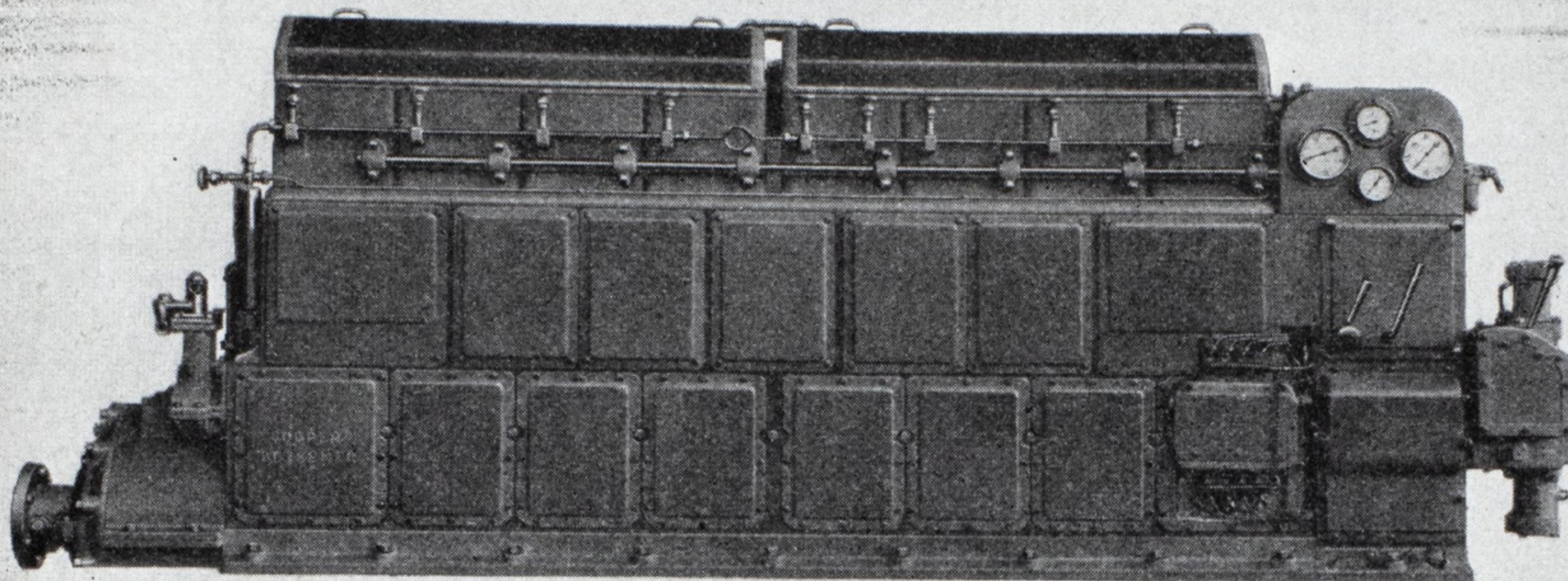


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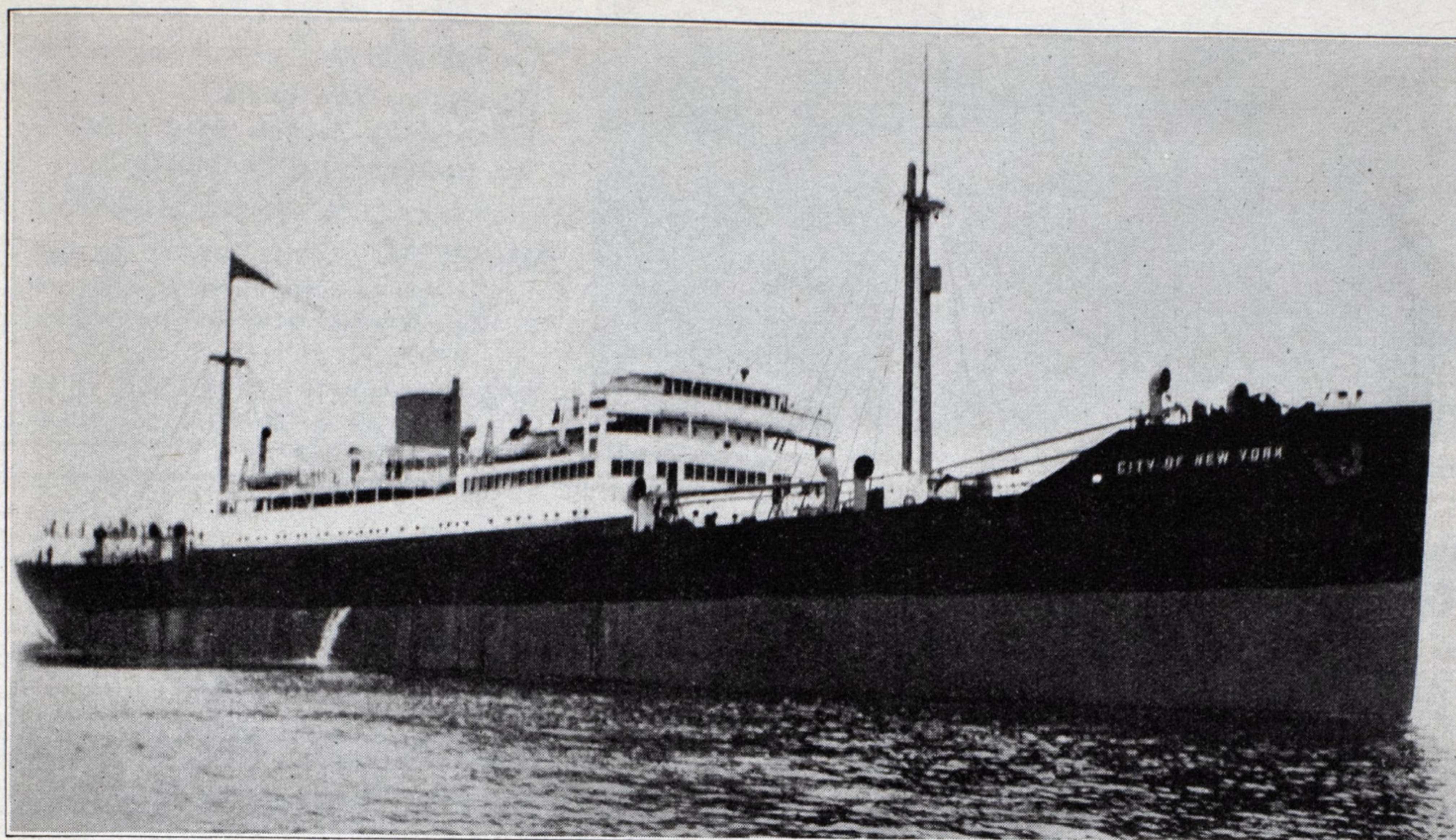
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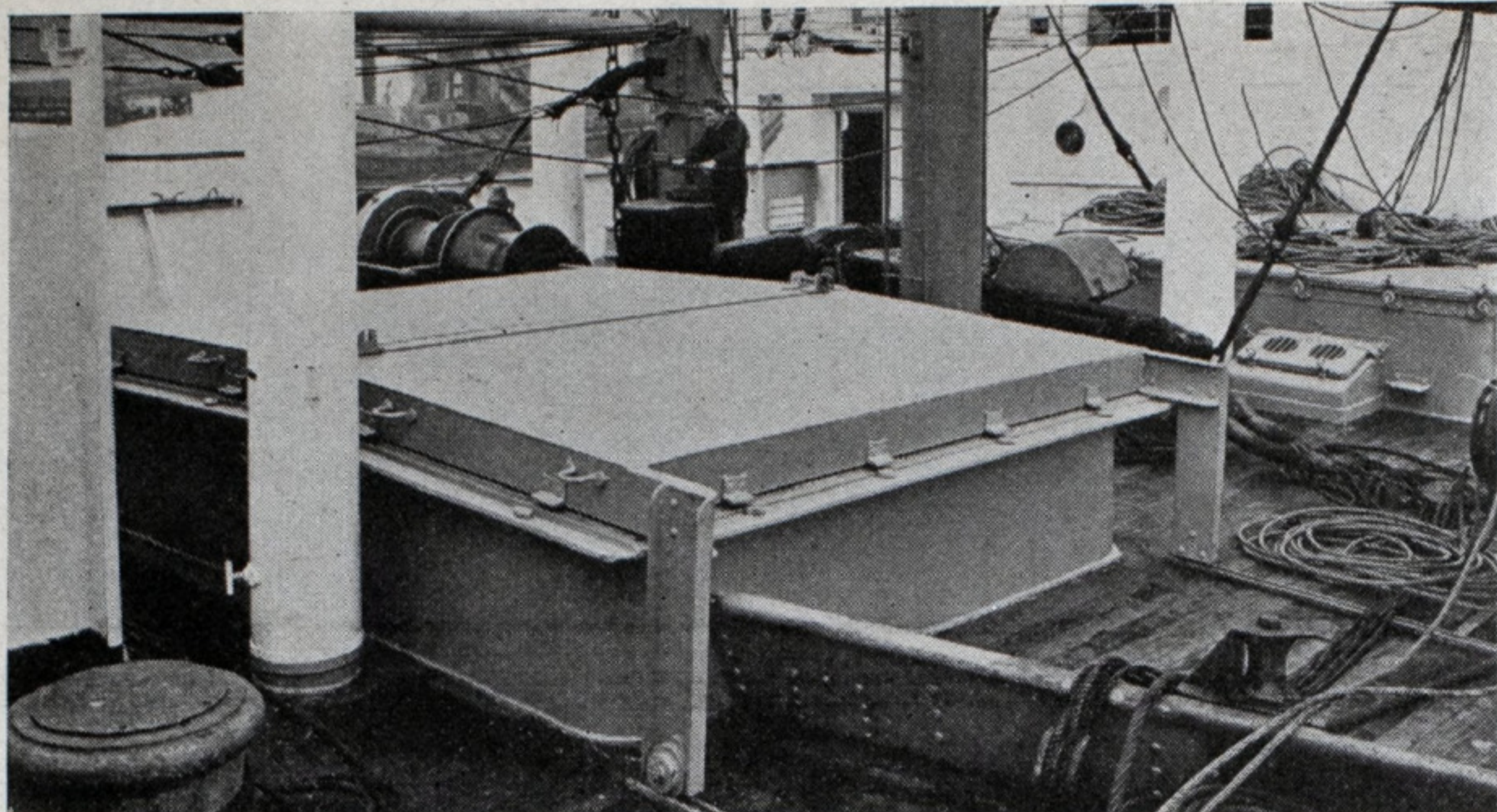
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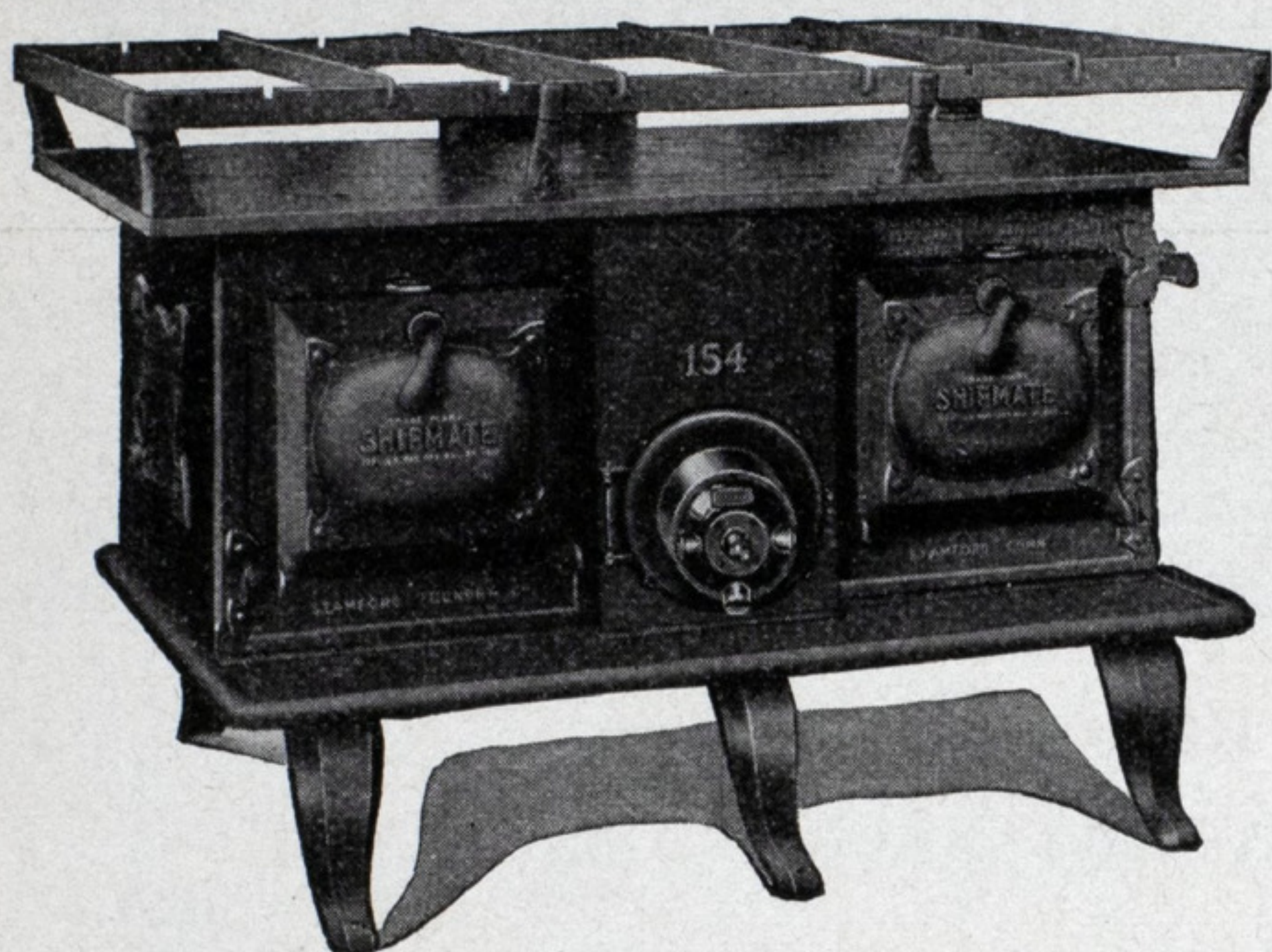
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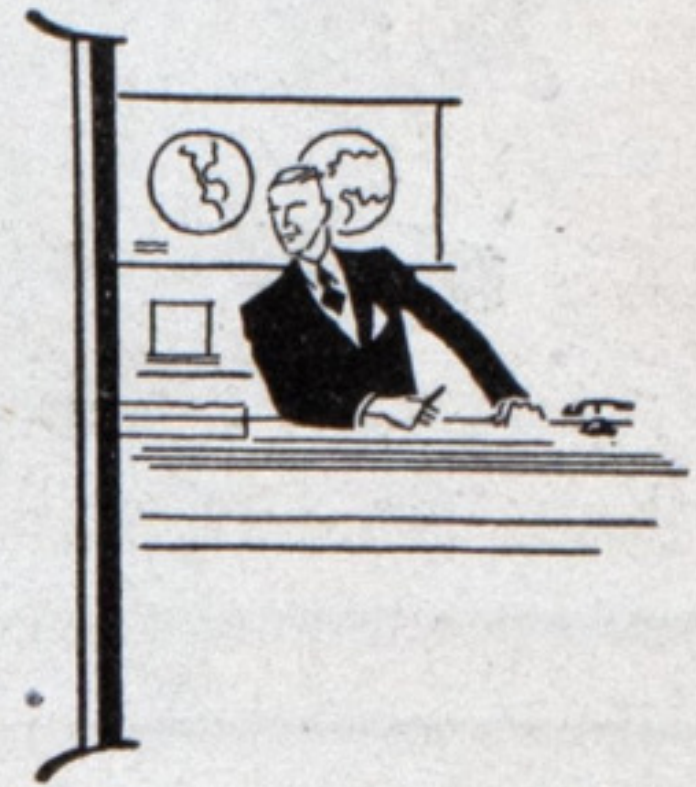
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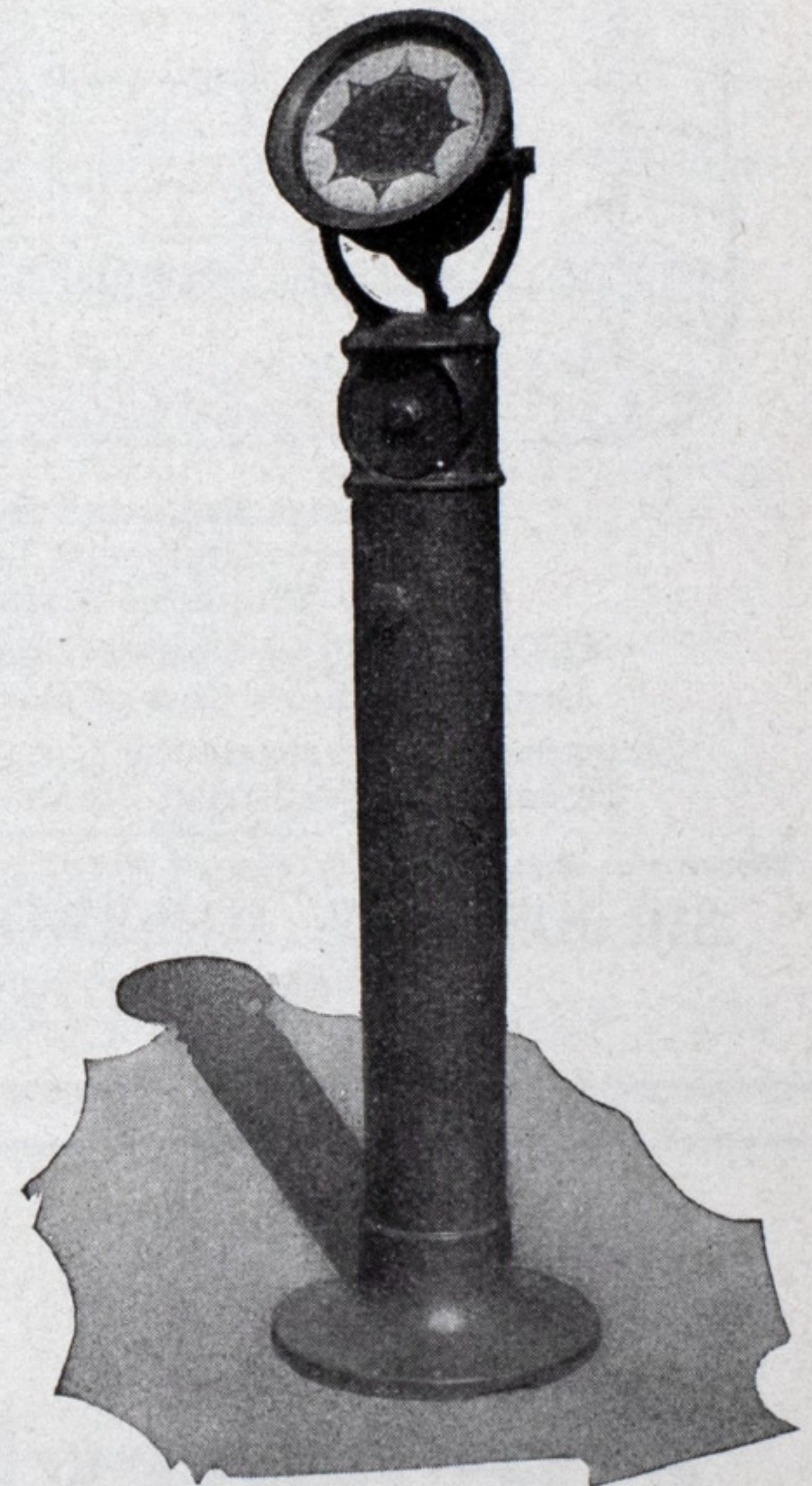
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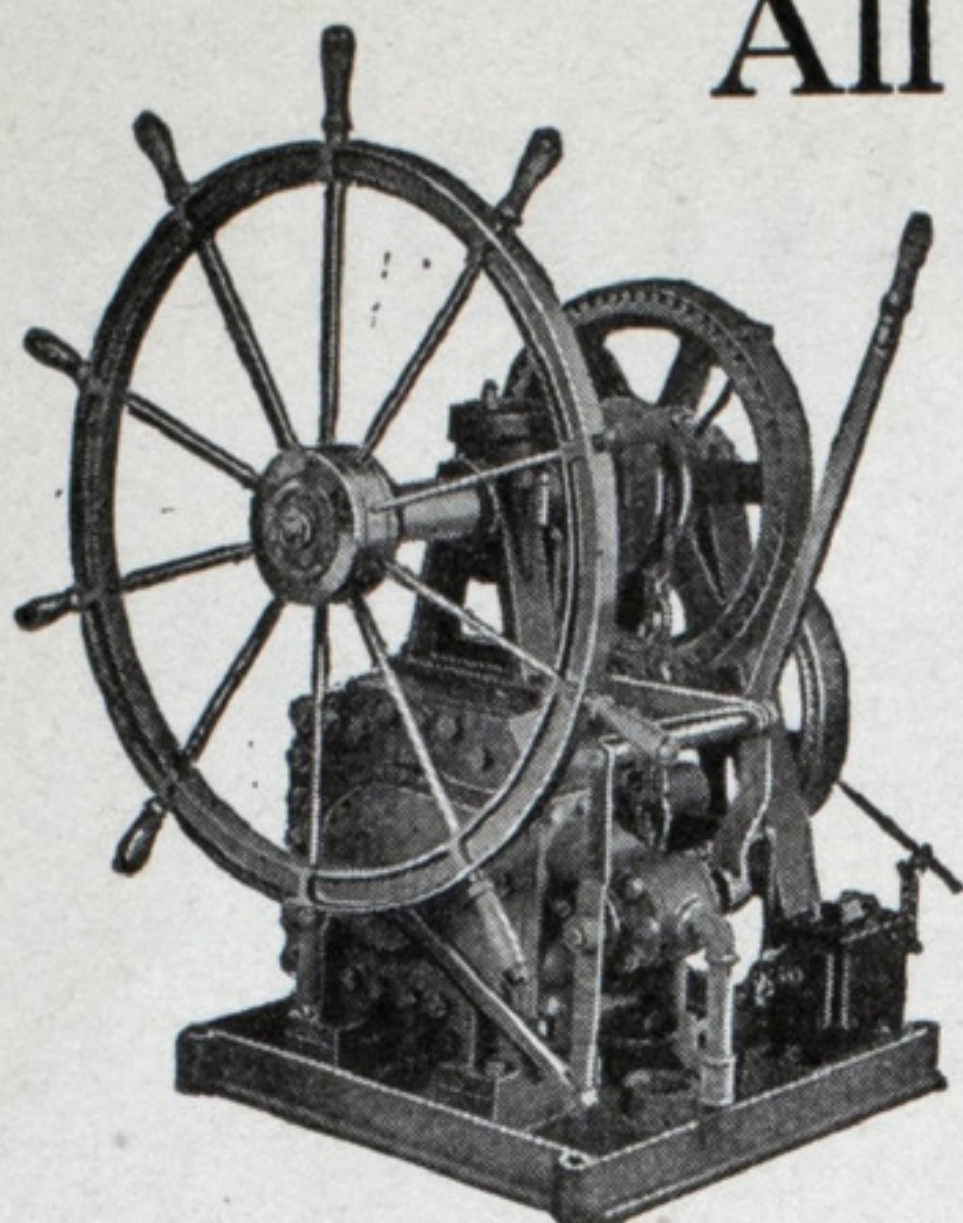
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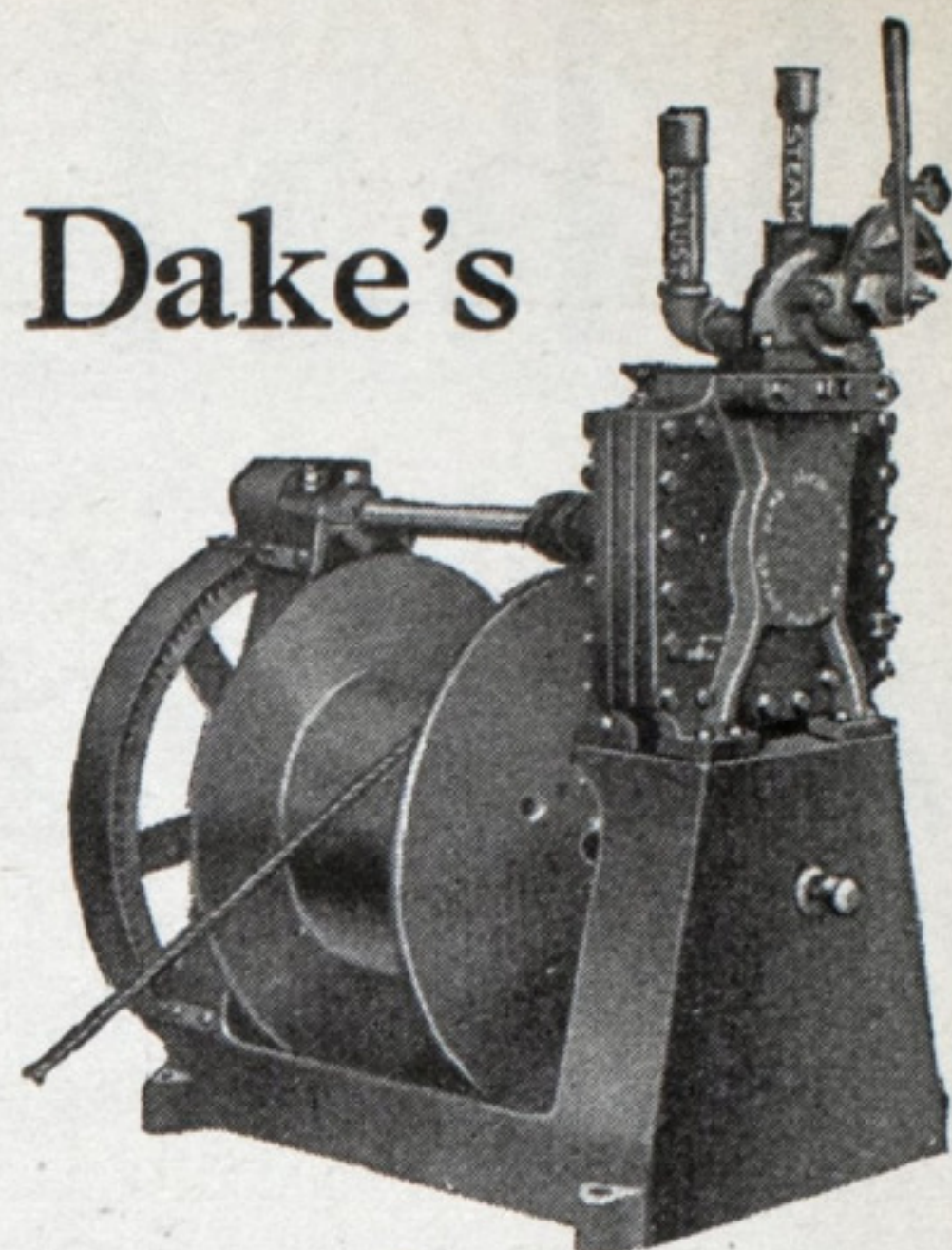


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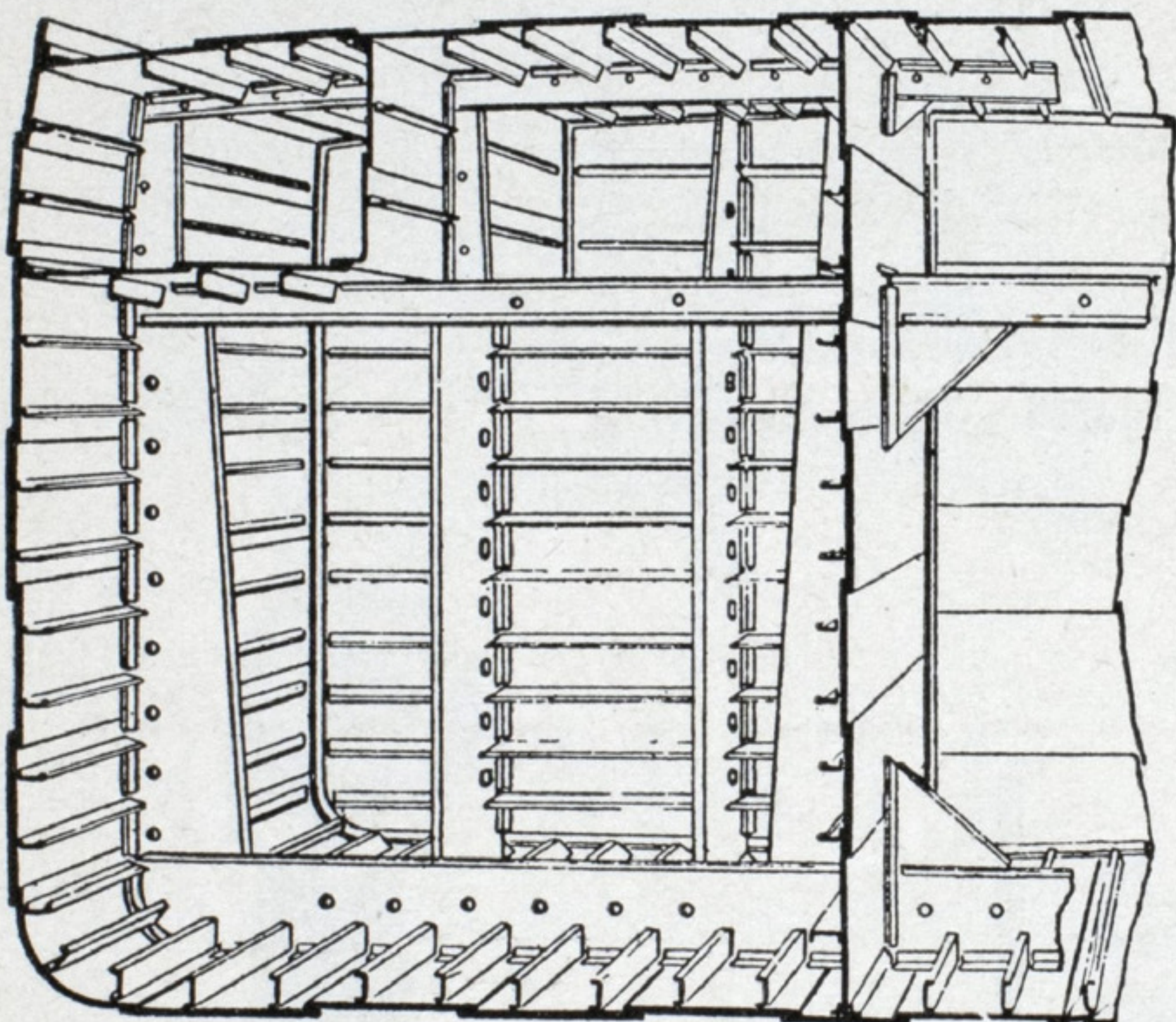
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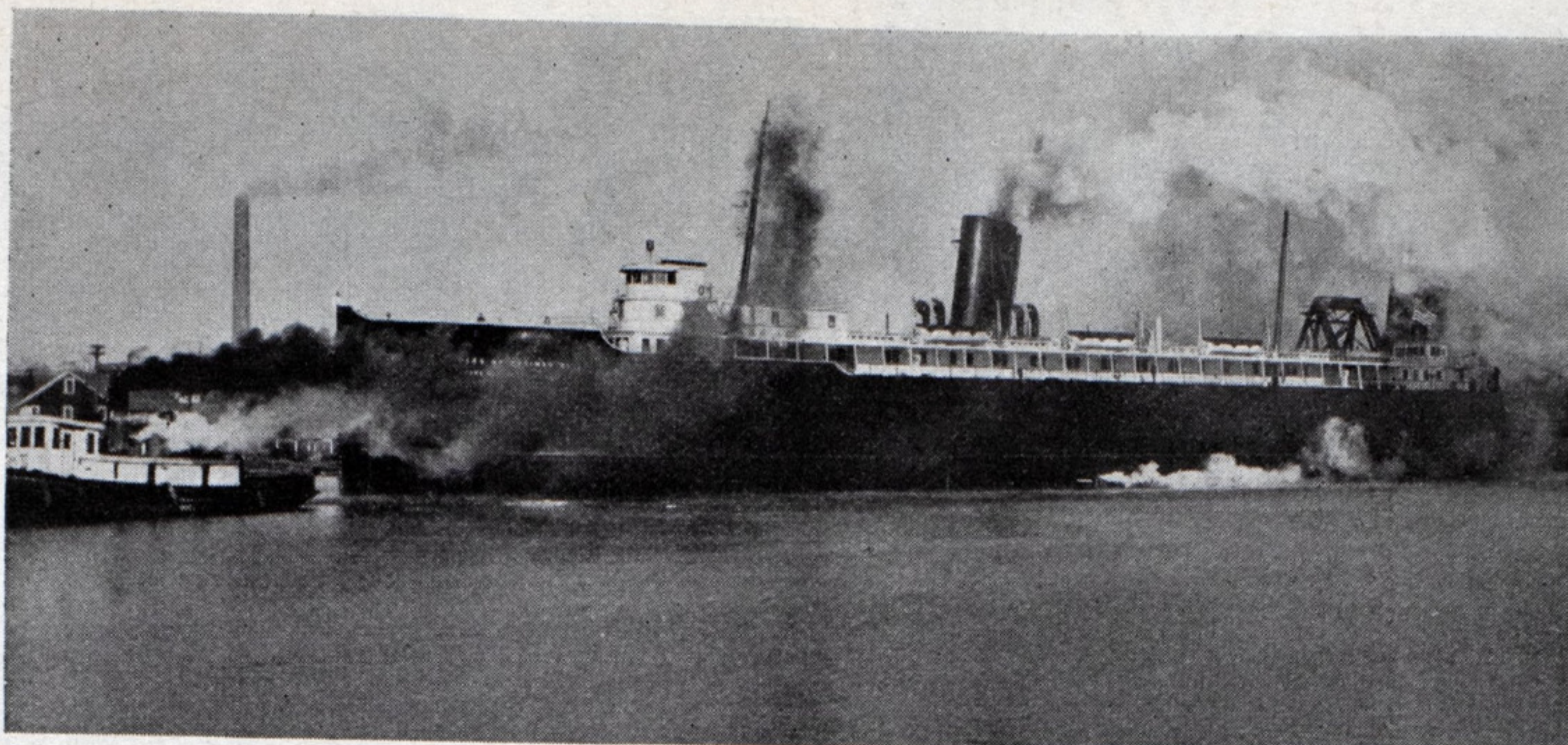
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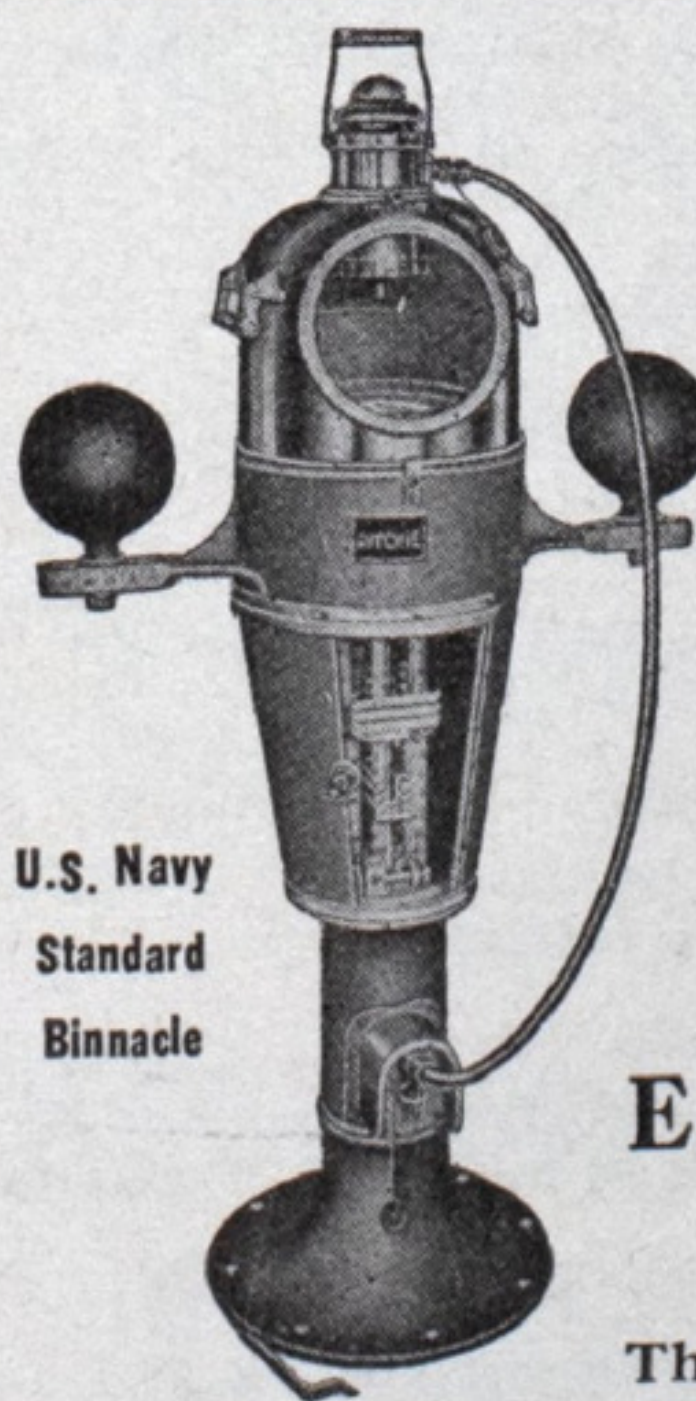
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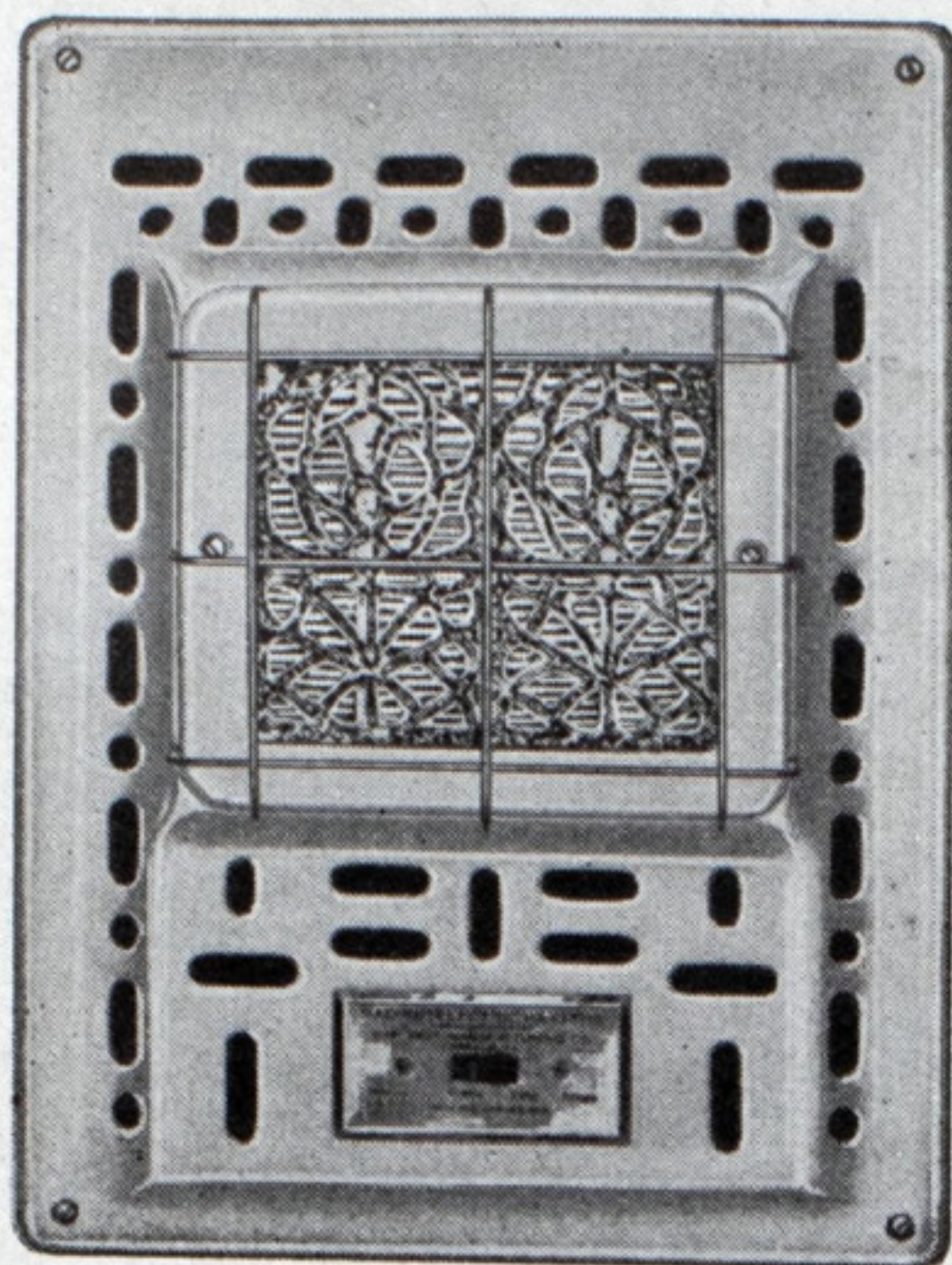
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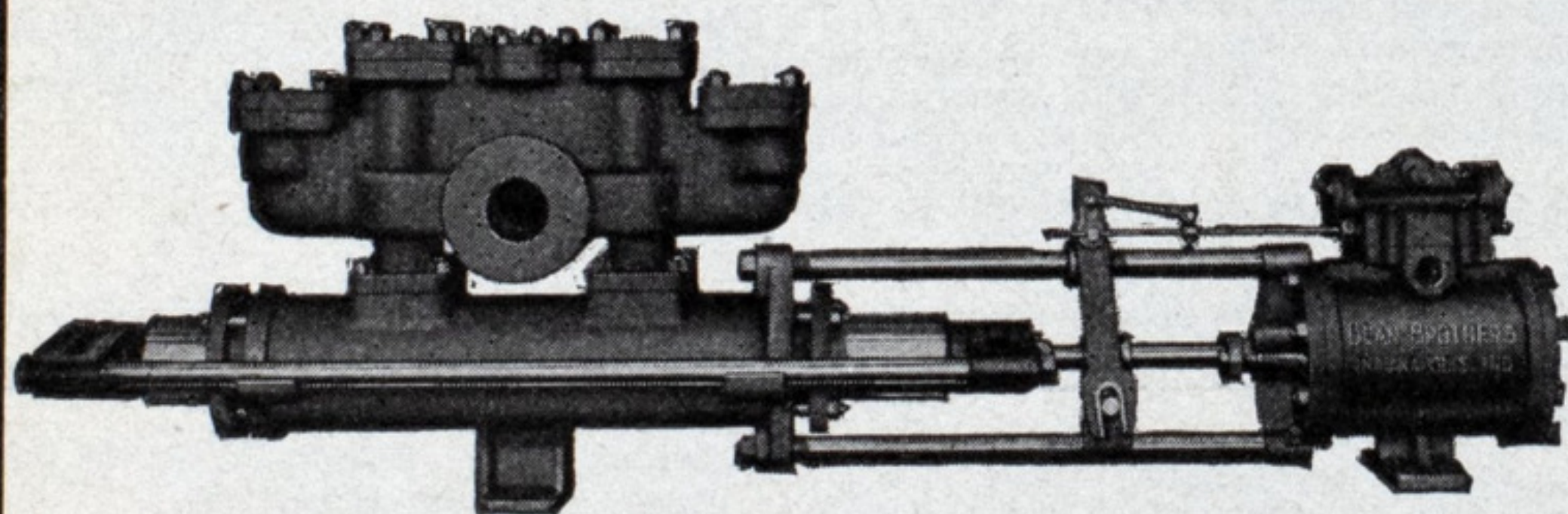


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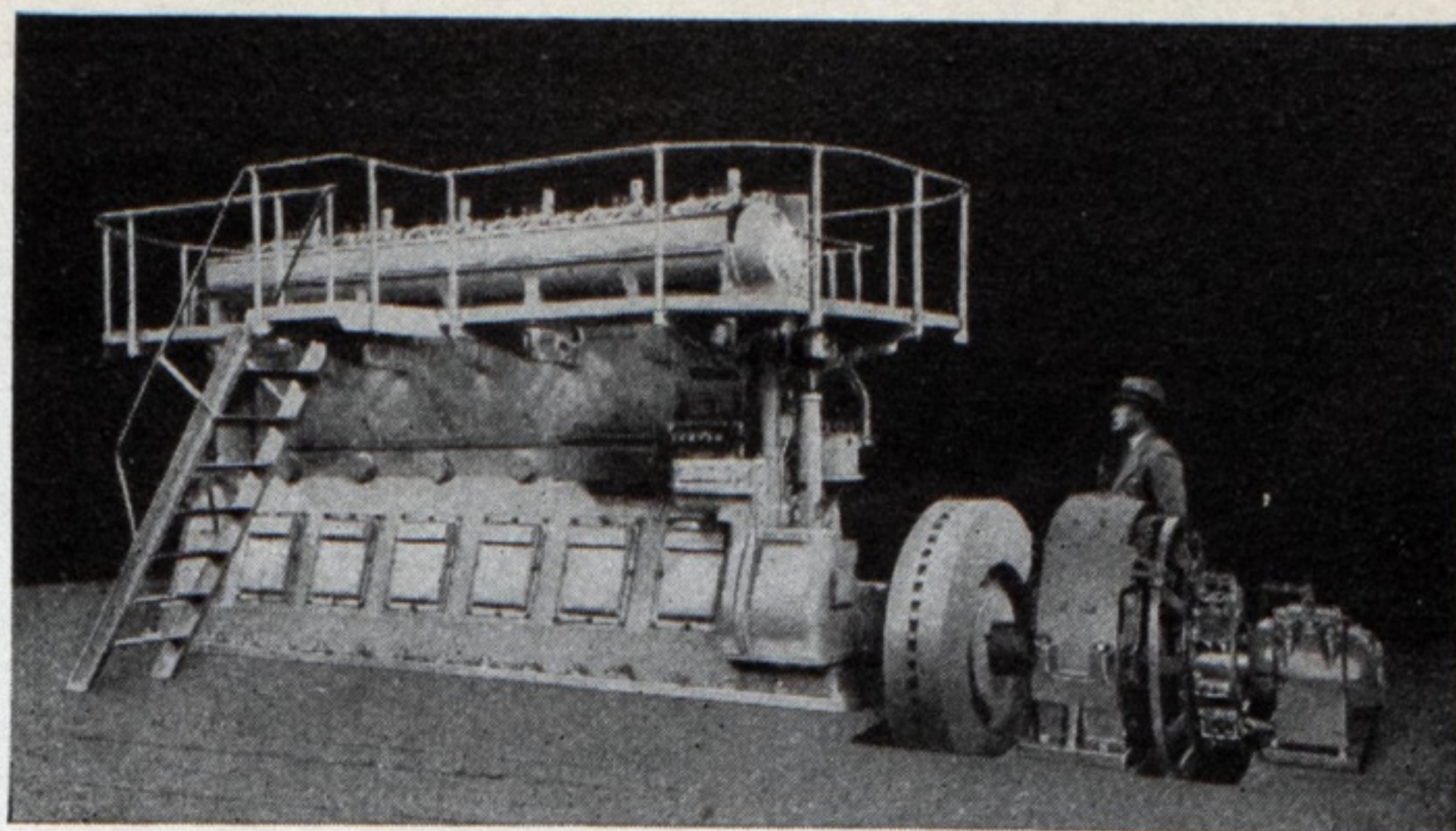
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THIS combination is decidedly more dependable and economical than steam operation.

Electric power avoids pre-warming delays and losses and in cold weather the danger from freezing and cracking of condensation-filled cylinders.

Small flexible service cables, conveniently carried to any location, placed at almost no expense and functioning perfectly with little inspection and repair, are a wholesome contrast to cumbersome unsightly insulated steam lines, which are hard to keep tight at the joints and in cold weather are always wasteful of steam.

The Diesel-electric generating units, complete and independent are always ready for instant start, consume no fuel while standing by and during the operating periods handle any load, small or large, at an economy comparing favorably with that of the main engines at their best.

McIntosh & Seymour Engines have a 14-year record for making Diesel-electric power intensely profitable to ship owners all over the globe, and are backed by a builder with unfailing devotion to the cause of transportation service.

Let us submit cost and operating data and guarantees. Our Engineers co-operate in adaptation to the hull of existing or new vessels.

McIntosh & Seymour Corporation

Division of American Locomotive Company

Main Offices and Works: Auburn, N. Y.

New York City Washington, D. C. Houston, Texas
 30 Church St. 910 Seventeenth St., N. W. 2408 Esperson Bldg.

Kansas City, Mo.
 1016 Baltimore Ave.

San Francisco
 514 Matson Bldg.

MCINTOSH & SEYMOUR DIESEL ENGINES

ENGINES (Marine) Cont.

Newport News Shipbuilding & Dry Dock Co., 90 Broad St., New York City.
 New York Shipbuilding Co., Camden, N. J.
 Sturtevant, B. F., Co., Inc., Hyde Park, Boston, Mass.
 Sun Shipbuilding & Dry Dock Co., Chester, Pa.
 Todd Shipyards Corp., 25 Broadway, New York City.
 United Dry Docks Inc., 11 Broadway, New York City.

ENGINES (Oil)

Cooper-Bessemer Corp., The, Mt. Vernon, Ohio.
 Standard Motor Construction Co., 184 Whiton St., Jersey City, N. J.
 Sun Shipbuilding & Dry Dock Co., Chester, Pa.

ENGINES (Steam, Steering)

Dake Engine Co., Grand Haven, Mich.

ENGINES (Vertical, Enclosed, Self Oiling)

Troy Engine & Machine Co., Troy, Pa.

EUROPEAN STEAMSHIP LINES (Passenger and Freight)

Hamburg-American Line, 39 Broadway, New York City.

EVAPORATORS

Griscom-Russell Co., 285 Madison Ave., New York City.

FANS

Diehl Mfg. Co., Elizabethport, N. J.

FANS (Electric)

General Electric Co., Schenectady, N. Y.
 Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
 Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

FEED WATER HEATERS—See HEATERS AND PURIFIERS (Feed Water)**FEED WATER REGULATORS**

Babcock & Wilcox Co., 85 Liberty St., New York City.

FIRE BRICK

Babcock & Wilcox Co., The, 85 Liberty St., New York City.

FLOORING

Selby, Battersby & Co., 33rd & Arch Sts., Philadelphia.

FLOOR PLATES

Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.

FOUNDERS

American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
 New York Shipbuilding Co., Camden, N. J.

FREIGHT SERVICE

Hamburg-American Line, 39 Broadway, New York City.

FUEL OIL

Vacuum Oil Co., 61 Broadway, New York City.

GAGES (Water)

Jerguson Gage & Valve Co., Somerville, Mass.

GALLEY RANGES

Stamford Foundry Co., Stamford, Conn.

GEARS (Electric)

General Electric Co., Schenectady, N. Y.

GEARS (Marine Equipment)

Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

GENERATING SETS

General Electric Co., Schenectady, N. Y.
 Troy Engine & Machine Co., Troy, Pa.

GENERATING SETS (Direct Connected)

Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
 Troy Engine & Machine Co., Troy, Pa.
 Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

GENERATORS

Diehl Mfg. Co., Elizabethport, N. J.
 General Electric Co., Schenectady, N. Y.
 Troy Engine & Machine Co., Troy, Pa.
 Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

GREASE

Vacuum Oil Co., 61 Broadway, New York City.

GREASE (Launching)

Vacuum Oil Co., 61 Broadway, New York City.

GYPSEYS

American Engineering Co., The, Cumberland & Aramingo Sts., Philadelphia, Pa.

GYRO-PILOT (Automatic Steering)

Sperry Gyroscope Co., The, Brooklyn, N. Y.

HATCHES (Steel)

MacGregor & King, Ltd., 5 Lloyd's Ave., London, E.C.3, Eng.

HAWSERS (Manila)

Columbian Rope Co., Auburn, N. Y.
 Samson Cordage Works, Boston.
 Whitlock Cordage Co., 46 South St., New York City.

HEATERS (Electric)

Superior Mfg. Co., The, Gregg St., Carnegie, Pa.

HEATERS AND PURIFIERS (Feed Water)

Davis Engineering Co., 90 West St., New York City.
 Griscom-Russell Co., 285 Madison Ave., New York City.
 Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

HEATING EQUIPMENT

Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
 Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

HEATING STOVES

Stamford Foundry Co., Stamford, Conn.

HOISTING ENGINES

Hyde Windlass Co., Bath, Me.

HOISTS (Air)

American Shipbuilding Co., Foot of W. 54th St., Cleveland.

HOISTS (Electric, Pneumatic, Hand)

American Engineering Co., The, Cumberland & Aramingo Sts., Philadelphia, Pa.

ICE MACHINES—See REFRIGERATING MACHINERY**INDICATORS (Direction & Revolution)**

Sperry Gyroscope Co., The, Brooklyn, N. Y.

INDICATORS (Helm Angle)

Sperry Gyroscope Co., The, Brooklyn, N. Y.

INDICATORS (Speed)

Sperry Gyroscope Co., The, Brooklyn, N. Y.

INSURANCE (Marine)

Boland & Cornelius, Marine Trust Bldg., Buffalo, N. Y.

LAMPS (Mazda and Arc)

General Electric Co., Schenectady, N. Y.

LIFEBOATS

Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

LIFESAVING EQUIPMENT

Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

LIGHTING EQUIPMENT

General Electric Co., Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

LUBRICATING OIL

Vacuum Oil Co., 61 Broadway, New York City.

MACHINERY (Marine)

American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
 Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
 Cooper-Bessemer Corp., The, Mt. Vernon, Ohio.
 Great Lakes Engineering Works, River Rouge, Mich.
 Manitowoc Ship Building Corp., Manitowoc, Wis.
 Maryland Dry Dock Co., Baltimore, Md.

MACHINES (Sounding)

Submarine Signal Co., 160 State St., Boston, Mass.

MACHINISTS

American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
 Federal Shipbuilding & Dry Dock Co., Lincoln Highway, Kearney, N. J.
 New York Shipbuilding Co., Camden, N. J.

MAGNETS (Lifting)

Cutler-Hammer, Inc., 1265 St. Paul Avenue, Milwaukee, Wis.

MANILA OAKUM—See OAKUM (Marine, Rope, Packings, Plumbers)**MARINE RAILWAY BUILDERS**

Crandall Engineering Co., The, 134 Main St., Cambridge, Mass.

METERS (Gas & Air)

Cutler-Hammer, Inc., 1265 St. Paul Avenue, Milwaukee, Wis.

MOTOR GENERATOR SETS

General Electric Co., Schenectady, N. Y.
 Troy Engine & Machine Co., Troy, Pa.
 Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

MOTORS

Diehl Mfg. Co., Elizabethport, N. J.

MOTORS (Electric)

General Electric Co., Schenectady, N. Y.
 Troy Engine & Machine Co., Troy, Pa.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

NAUTICAL INSTRUMENTS

Ritchie, E. S., & Sons, Brookline, Mass.
 Sperry Gyroscope Co., The, Brooklyn, N. Y.

NAVIGATING INSTRUMENTS

White, Kelvin & Wilfrid O., Co., 112 State St., Boston, Mass.

OAKUM (Marine, Rope, Packing, Plumbago)

Stratford, Geo., Oakum Co., 120 Montgomery St., Jersey City, N. J.

OIL BURNING EQUIPMENT

Babcock & Wilcox Co., 85 Liberty St., New York City.
 Coen Co., Inc., 610 S. Broadway, Los Angeles, Cal.
 Sturtevant, B. F., Co., Hyde Park, Boston, Mass.

OIL FOR ALL PURPOSES (Marine)

Vacuum Oil Co., 61 Broadway, New York City.

PASSENGER SERVICE

Hamburg-American Line, 39 Broadway, New York City.

POWDERED COAL BURNERS

Coen Co., Inc., 610 S. Broadway, Los Angeles, Cal.

PROPELLER BLADES AND HUBS

Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLER WHEELS

American Shipbuilding Co., Foot of W. 54th St., Cleveland, O.
 Great Lakes Engineering Works, River Rouge, Mich.
 Newport News Shipbuilding & Dry Dock Co., 90 Broad St., New York City.
 Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLERS

Hyde Windlass Co., Bath, Me.
 Newport News Shipbuilding & Dry Dock Co., 90 Broad St., New York City.

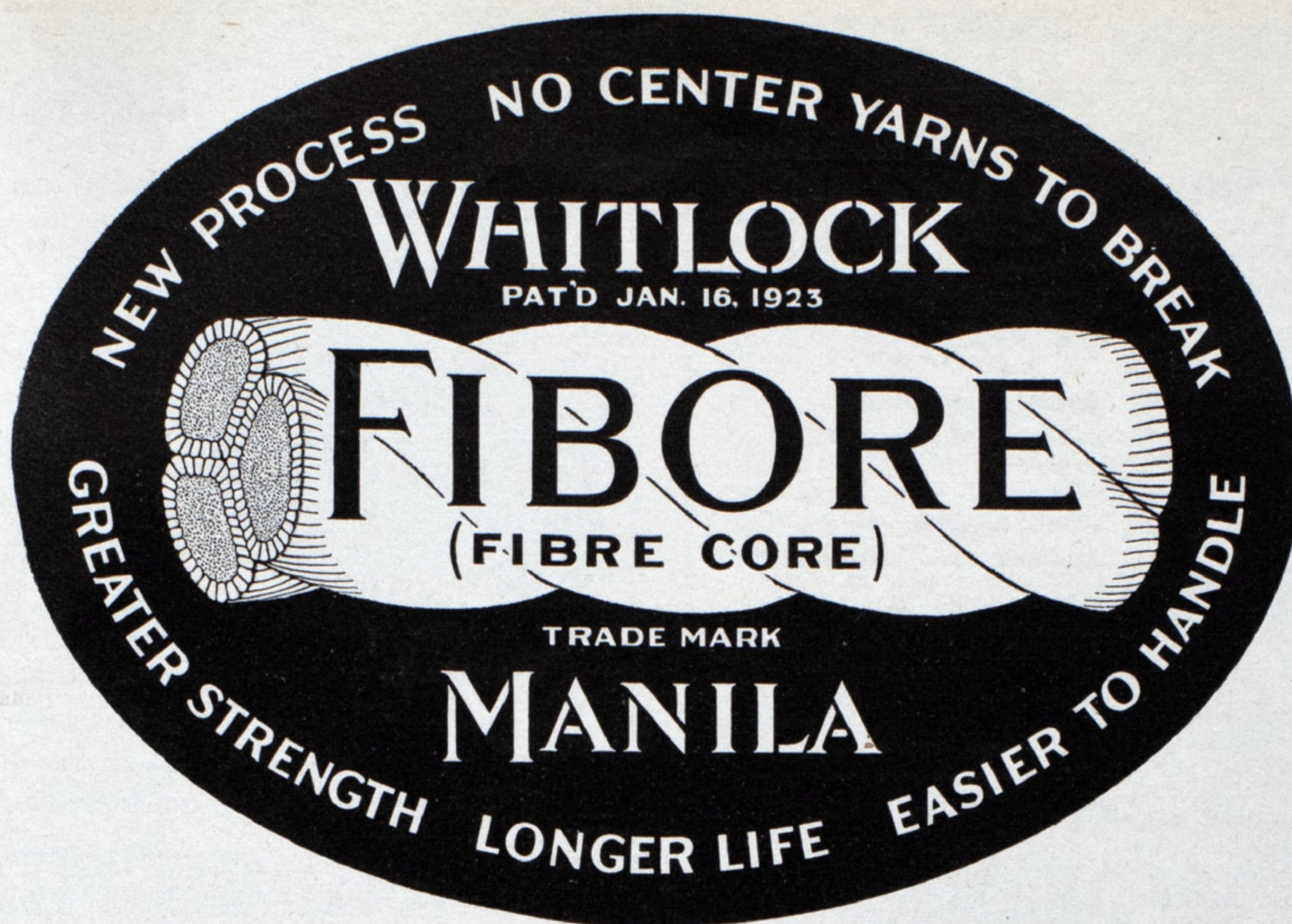
PULVERIZED COAL BURNERS

Todd Shipyards Corp., 25 Broadway, New York City.

PULVERIZED COAL SYSTEMS

Todd Shipyards Corp., 25 Broadway, New York City.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above



WHITLOCK CORDAGE COMPANY

46 South Street, New York

REFLEX WATER GAGES

Used on all types of boilers by all the Principal Navies of the world

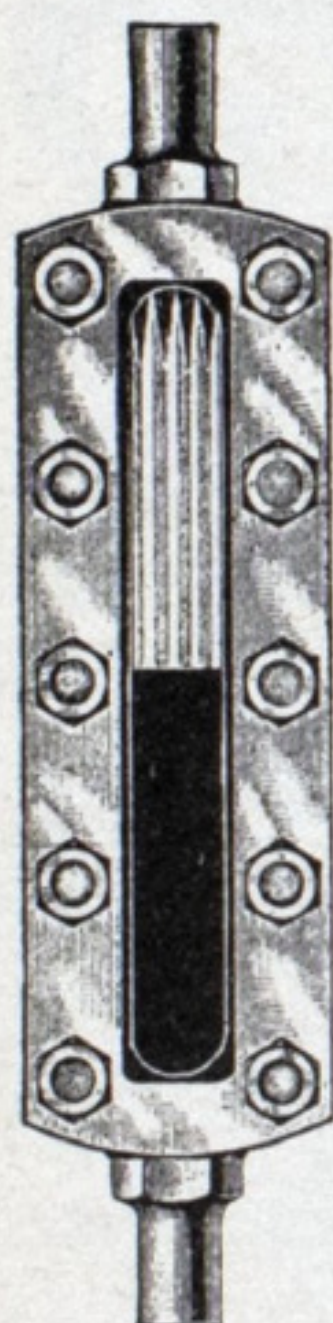
"The Water Shows Black"

ADVANTAGES: Quick and reliable observation of the water level. Safe, sure and durable at high pressure. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gage glass fittings.

When filled with WATER the Reflex Gage always appears **BLACK**. When empty it instantly shows **WHITE**. No mistake possible. This feature alone is worth many times the cost of the Reflex.

Send for catalog of Water Gage Apparatus

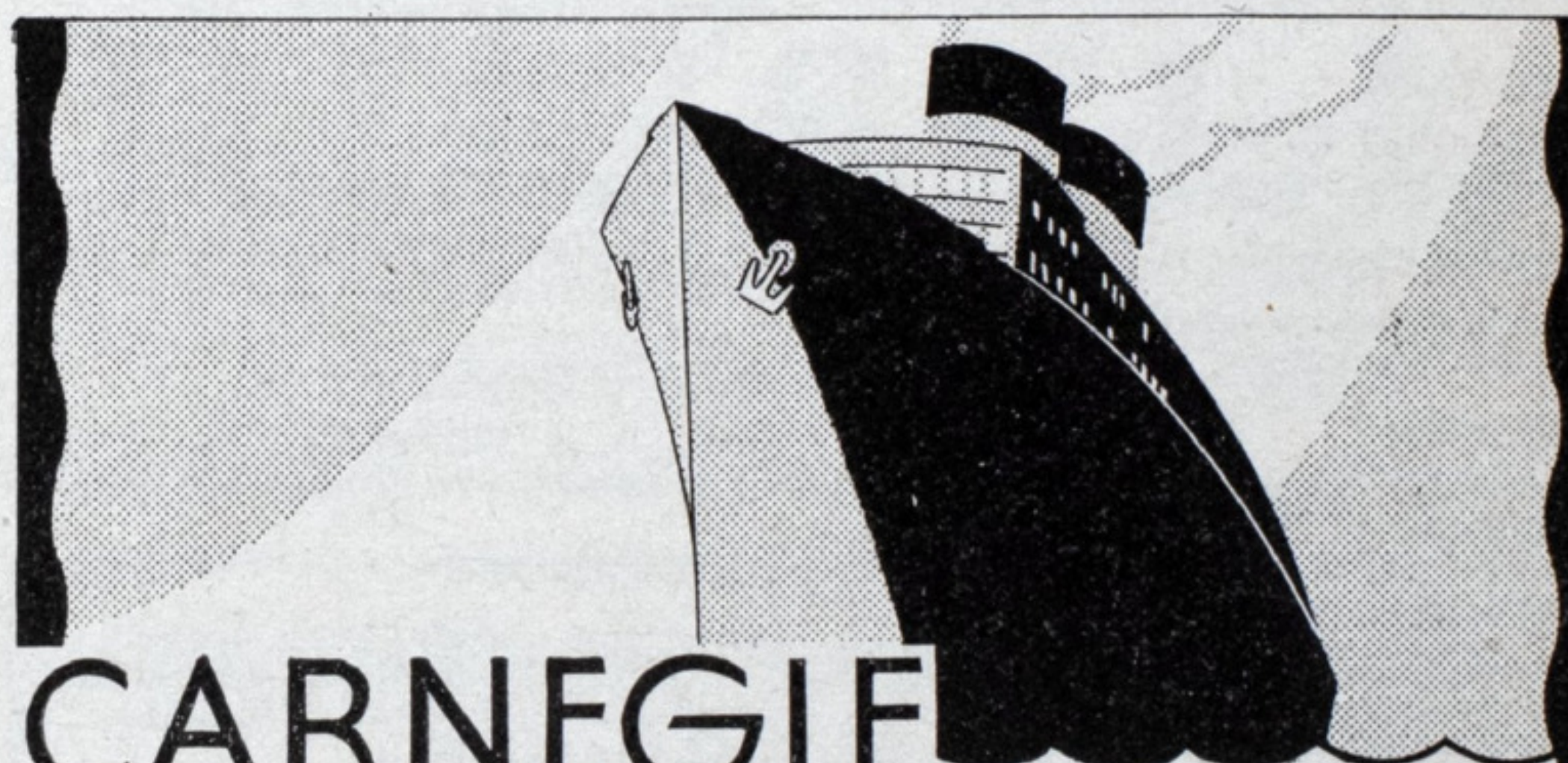
MANUFACTURED BY THE
**JERGUSON
GAGE & VALVE CO.**
WINTER HILL, SOMERVILLE, MASS.



Ship For Sale?

If you have a passenger ship, freighter, tanker, tug or any other floating property or marine equipment for sale advertise it in Marine Review.

The rate is \$3.00 for a minimum advertisement of 30 words. Additional words, 10c each.



CARNEGIE SHIP BUILDING PRODUCTS

A complete line of structural steel sections for shipbuilding purposes, including Carnegie Beams with their wide, parallel flanges, shipbuilding channels and bulb angles, Carnegie Floor Plate in a raised pattern insuring long wear and easy cleaning, and rolled steel plates of every description.

The name "Carnegie" has been identified with steel manufacture for nearly three-quarters of a century—a good name to look for on Steel.

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH, PA.

62

PUMPS

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.
Great Lakes Engineering Works,
River Rouge, Mich.

PUMPS (Ballast)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

PUMPS (Bilge)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

PUMPS (Boiler Feed)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

PUMPS (Direct Acting)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

PUMPS (Fuel Oil)

Coen Co., Inc., 610 S. Broadway,
Los Angeles, Cal.

PUMPS (Power)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

PUMPS (Steam)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

PUMPS (Vacuum)

Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

**PURIFICATION SYSTEMS—See
WATER PURIFICATION
SYSTEMS****RAFTS**

Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St.,
Brooklyn, N. Y.

RAILWAY DRY DOCKS

Crandall Engineering Co., The,
134 Main St., Cambridge, Mass.

RANGES

Stamford Foundry Co.,
Stamford, Conn.

REFRIGERATING MACHINERY

Brunswick-Kroeschell Co.,
New Brunswick, N. J.

REPAIRS

Maryland Dry Dock Co.,
Baltimore, Md.

REPAIRS (Electric)

General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

REPAIRS (Marine)

American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Charleston Dry Dock & Machine Co.,
Charleston, S. C.
Chicago Shipbuilding Co.,
So. Chicago, Ill.
Federal Shipbuilding & Dry Dock
Co., Lincoln Highway, Kearney,
N. J.
Great Lakes Engineering Works,
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Newport News Shipbuilding & Dry
Dock Co., 90 Broad St.,
New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City.
United Dry Docks, Inc.,
11 Broadway, New York City.

REPAIRS (Turbine)

General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

REVOLUTION COUNTERS

Sperry Gyroscope Co.,
Brooklyn, N. Y.

RIVET SETS

Wilcox-Rich Corp.,
9771 French Rd., Detroit, Mich.

**ROPE (Manila, Net, Sisal, and
Other Hard Fiber Cordage)**

Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co.,
46 South St., New York City.

ROPE (Transmission)

Columbian Rope Co.,
Auburn, N. Y.

ROPE OAKUM

Stratford, Geo., Oakum Co.,
120 Montgomery St.,
Jersey City, N. J.

RUBBER TILE

Selby, Battersby & Co.,
33rd & Arch Sts., Philadelphia.

RUST PREVENTATIVE (Oil)

Vacuum Oil Co., 61 Broadway,
New York City.

SAFETY VALVES (Marine)

Star Brass Mfg. Co.,
53 Oliver St., Boston, Mass.

SCHOONERS (Auxiliary)

American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.

SEARCHLIGHTS

General Electric Co.,
Schenectady, N. Y.

SEARCHLIGHTS (High Intensity)

Sperry Gyroscope Co., The,
Brooklyn, N. Y.

**SEARCHLIGHTS
(Incandescent and Arc)**

Sperry Gyroscope Co., The,
Brooklyn, N. Y.

SEPARATORS (Oil)

Babcock & Wilcox Co.,
85 Liberty St., New York City.

SHIPBUILDERS

American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Charleston Dry Dock & Machine Co.,
Charleston, S. C.
Federal Shipbuilding & Dry Dock
Co., Lincoln Highway, Kearney,
N. J.
Great Lakes Engineering Works,
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Maryland Dry Dock Co.,
Baltimore, Md.
Newport News Shipbuilding & Dry
Dock Co., 90 Broad St.,
New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City.
United Dry Docks, Inc.,
11 Broadway, New York City.

SHIPBUILDING SYSTEMS

Isherwood, J. W., & Co., Ltd.,
17 Battery Place, New York City.

SHIP STABILIZERS

Sperry Gyroscope Co., The,
Brooklyn, N. Y.

SIGNALS (Submarine)

Submarine Signal Co.,
160 State St., Boston, Mass.

SOUNDING MACHINES

Submarine Signal Co.,
160 State St., Boston, Mass.

SPUN OAKUM

Stratford, Geo., Oakum Co.,
120 Montgomery St.,
Jersey City, N. J.

STEAMSHIP LINES

(Passenger and Freight)
Hamburg-American Lines,
39 Broadway, New York City.

STEAM GAGES

Star Brass Mfg. Co.,
53 Oliver St., Boston, Mass.

**STEAMSHIP COMPANIES (Lake
Passenger & Freight)**

Cleveland & Buffalo Transit Co.,
The, E. 9th St. Pier, Cleveland.

STEAM TRAPS

Davis Engineering Co.,
90 West St., New York City.

**STEEL BARGES—See BARGES
(Steel)****STEEL TANKS**

Brunswick-Kroeschell Co.,
New Brunswick, N. J.

STEERING ENGINES

Hyde Windlass Co., Bath, Me.

STEERING GEARS

American Engineering Co., The,
Cumberland & Aramingo Sts.,
Philadelphia, Pa.
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Hyde Windlass Co., Bath, Me.

STOKERS

Babcock & Wilcox Co., The,
85 Liberty St., New York City.

**STORAGE BATTERIES—See
BATTERIES****STOVES**

Stamford Foundry Co.,
Stamford, Conn.

STRAINERS (Oil)

Coen Co., Inc., 610 S. Broadway,
Los Angeles, Cal.

SUPERHEATERS

Babcock & Wilcox Co., The,
85 Liberty St., New York City.

SWITCHBOARDS

General Electric Co.,
Schenectady, N. Y.
Troy Engine & Machine Co.,
Troy, Pa.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

TELEMOTEORS

Hyde Windlass Co., Bath, Me.

**TELEMOTORS (Hydraulic &
Electric)**

American Engineering Co., The,
Cumberland & Aramingo Sts.,
Philadelphia, Pa.

TOWING & MOORING ENGINES

American Engineering Co., The,
Cumberland & Aramingo Sts.,
Philadelphia, Pa.

TOWING LINES

Columbian Rope Co., Auburn, N. Y.
Whitlock Cordage Co.,
46 South St., New York City.

TRACTORS

Clark Tractor Co.,
Battle Creek, Mich.
Elwell-Parker Electric Co., The,
4205 St. Clair Ave., Cleveland, O.

**TRANSMISSION (Rope)—See
ROPE (Transmission)****TRUCKS**

Clark Tractor Co.,
Battle Creek, Mich.
Elwell-Parker Electric Co., The,
4205 St. Clair Ave., Cleveland, O.

TRUCKS (Dump)

Clark Tractor Co.,
Battle Creek, Mich.

TURBINES (Electric)

Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

TURBINES (Marine)

Federal Shipbuilding & Dry Dock
Co., Lincoln Highway, Kearney,
N. J.
General Electric Co.,
Schenectady, N. Y.
Newport News Shipbuilding & Dry
Dock Co., 90 Broad St.,
New York City.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

TURBINES (Steam)

DeLaval Steam Turbine Co.,
Trenton, N. J.
General Electric Co.,
Schenectady, N. Y.
Newport News Shipbuilding & Dry
Dock Co., 90 Broad St.,
New York City.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

TWINE AND ROPE

Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co.,
46 South St., New York City.

VENTILATING EQUIPMENT

Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

VENTILATORS

Allen Corp.,
1040 14th St., Detroit, Mich.

WATER COOLERS

General Electric Co.,
Schenectady, N. Y.

**WATER PURIFICATION
SYSTEMS**

Griscom-Russell Co.,
285 Madison Ave., New York City.

WELDERS (Electric Arc)

General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

WHISTLES

Star Brass Mfg. Co.,
53 Oliver St., Boston, Mass.

WINCHES

American Engineering Co., The,
Cumberland & Aramingo Sts.,
Philadelphia, Pa.
Dake Engine Co.,
Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WINDLASSES

American Engineering Co., The,
Cumberland & Aramingo Sts.,
Philadelphia, Pa.
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Dake Engine Co.,
Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WINDOWS (Balanced Frameless)

Kearfoot Engineering Co.,
117 Liberty St., New York City.

WORKBOATS

Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above



"Then only, far under in the depths of her hold, Some gleam of its wonder man's eye may behold."
—Swinburne.

EACH beam, each well fitted timber, each sturdy rib and plank strong enough to stand the wildest gale,—and she's tight if properly caulked.

The experienced sailor knows the value of tight seams—no one need tell him that—but thousands of ships on the seven seas assure him that his seams will be tightest when caulked with

STRATFORD OAKUM

For almost a century Stratford Oakum has caulked the seams of the finest vessels that sail the seas. Be sure you get genuine Stratford Oakum. There is no other "just as good."

George Stratford Oakum Company
JERSEY CITY, NEW JERSEY

Also manufacturers of Cotton Wiping Waste

*3

SAMSON SPOT Log Lines

Smooth, tough and durable; no adulterating material to stiffen it and decrease strength and durability. Solid braided of extra quality cotton yarn. Uniform in size and quality. Easily identified by the colored spots, our trade mark.

We also manufacture flag halyards, lead lines, tiller rope; solid braided cotton cord in all sizes for various marine uses. Ask for catalog and samples.



Trade Mark
Reg. U.S.
Pat. Off.



SAMSON CORDAGE WORKS

89 BROAD STREET

BOSTON, MASS.

GRISCOM-RUSSELL

Evaporators—Feed Water Heaters—Extraction Steam Heaters—Generator Air Coolers—Lubricating Oil Coolers—Steam, Air and Oil Separators—Filters—Strainers—Expansion Joints
Described in bulletins which will be sent on request

THE GRISCOM-RUSSELL COMPANY

285 Madison Avenue, NEW YORK

CHICAGO: 20 North Wacker Drive



Kelvin & Wilfrid O. White Co.

112 State Street, Boston

Ship Compasses
Navigational Equipment

Contracts a Specialty

New York and Montreal

Oldman-Magee Boiler Works, Inc.

Boilers, Tanks, Stacks, Structural Work and Castings

Boiler Repairing Promptly Attended to Day or Night

MARINE WORK A SPECIALTY

ELECTRIC WELDING

Works: 36-40 Illinois Street

BUFFALO, N. Y.

John J. Boland

Adam E. Cornelius

BOLAND & CORNELIUS

VESSEL OWNERS AND BROKERS

Marine Insurance Agents

Marine Trust Building BUFFALO, N. Y.

Edward P. Farley & Co.

Incorporated

Steamship Owners, Agents and Brokers

11 Broadway—New York



HAMBURG-AMERICAN LINE

PASSENGER SERVICES: New York to Cherbourg, Southampton and Hamburg. New York to Galway, Cobh (Queens-town), Cherbourg and Hamburg. North Pacific Ports to Hamburg, Bremen and Antwerp via Panama Canal.

PLEASURE CRUISES: Around the World, to the West Indies, to Northern Wonderlands.

FREIGHT SERVICES: New York to Hamburg (8 days). Boston, Philadelphia, Baltimore and Norfolk to Bremen and Hamburg.

North Pacific Ports direct to Hamburg, Bremen and Antwerp.

HAMBURG-AMERICAN LINE

39 Broadway

New York

Classified Advertisements

For Sale and Miscellaneous—Help and Positions Wanted

For Sale and Miscellaneous Advertisements
10c per word—minimum advertisement—\$3.00

Six words must be added for box address.

To insure insertion, advertisements must reach us by the
10th of the month preceding date of issue.

Help Wanted Advertisements
6c per word—minimum advertisement—\$3.00

Position Wanted Advertisements
4c per word—minimum advertisement—\$1.00

Please have remittance accompany order.

Position Wanted

MASTER AVAILABLE FOR STEAMER, Yacht, or Tug—I have Master's License for any part Great Lakes and St. Lawrence River to Montreal—20 years experience as Master—Charges reasonable. Sidney LeBean, Hammond, N. Y.

For Sale

FOR SALE: SANDSUCKER KEWANEE. Capacity 110 yards. Ten inch Morris pump. Fore and aft compound engine. Scotch boiler, 150 lbs. steam. Will sell cheap as we have larger boat. Valley Sand Co., Bay City, Mich.

For Sale

FOR SALE
WOODEN TOW BARGE PESHTIGO
201' Keel 37' Beam 12' Depth.
O. W. Blodgett, Bay City, Mich.

Sealed Bids

U. S. ENGINEER OFFICE, FIRST NEW OR-leans district, Poland and Dauphine Sts., New Orleans, La., June 27, 1931.—Sealed bids, in duplicate, will be received until 3 P. M., July 28, 1931, and then publicly opened for furnishing all labor and materials and performing all work for dredging the Louisiana and Texas Intracoastal Waterway, Mississippi River—Atchafalaya River Section from Bayou Blue to Bayou Chene, La., comprising approximately 8,744,600 cubic yards, place measurement. Further information on application.

Wanted

WANTED: STEEL HULL TUG UNDER 65 ft. in length that can be converted to Diesel suitable for towing. Geo. Klemm, 4103 W. Jefferson, Detroit, Mich.

FOR SALE—STEEL DUMP BARGE

Sealed Bids will be received up to 10 A. M., July 15, 1931 and then opened for the sale of Steel Dump Barge—90 x 30 x 10 Ft. at Hopper Ends. Full information on application. Address City Engineer, Miami Beach, Florida.

WANTED

4 Three Furnace Scotch Boilers about 13' Diameter by 12' Long. Working Pressure 160 lbs. Fitted with oil burning Furnace Fronts. Purchasing Agent, Eastern SS Lines, Inc., Boston, Mass.

FOR SALE

WOODEN TOW BARGE N. C. HOLLAND
187' Keel 32' Beam 11' 2" Depth.
O. W. Blodgett, Bay City, Mich.

TO OUR SUBSCRIBERS

The classified section of MARINE REVIEW is for your convenience—its value is proving worthwhile to everyone who uses it to buy and sell.

If you want to buy or sell ships or marine equipment—need a man for your organization—make it known to the entire marine industry through the use of classified advertising in MARINE REVIEW.

Mail copy for your advertisement in the August issue today, so it reaches us before July 20.



TRAVEL

Via

Lake Erie

New Low Fares
and Auto Rates

Between CLEVELAND and BUFFALO

May 1st to Nov. 1st, leaving, each way at 9:00 P. M.,
arriving 7:30 A. M. (E. S. T.)

\$4.50 One Way :-: \$7.50 Round Trip

*Autos carried to June 15th and after Sept. 15th,
\$5.00 any size car. Summer rates, only
\$6.50 and \$7.50*

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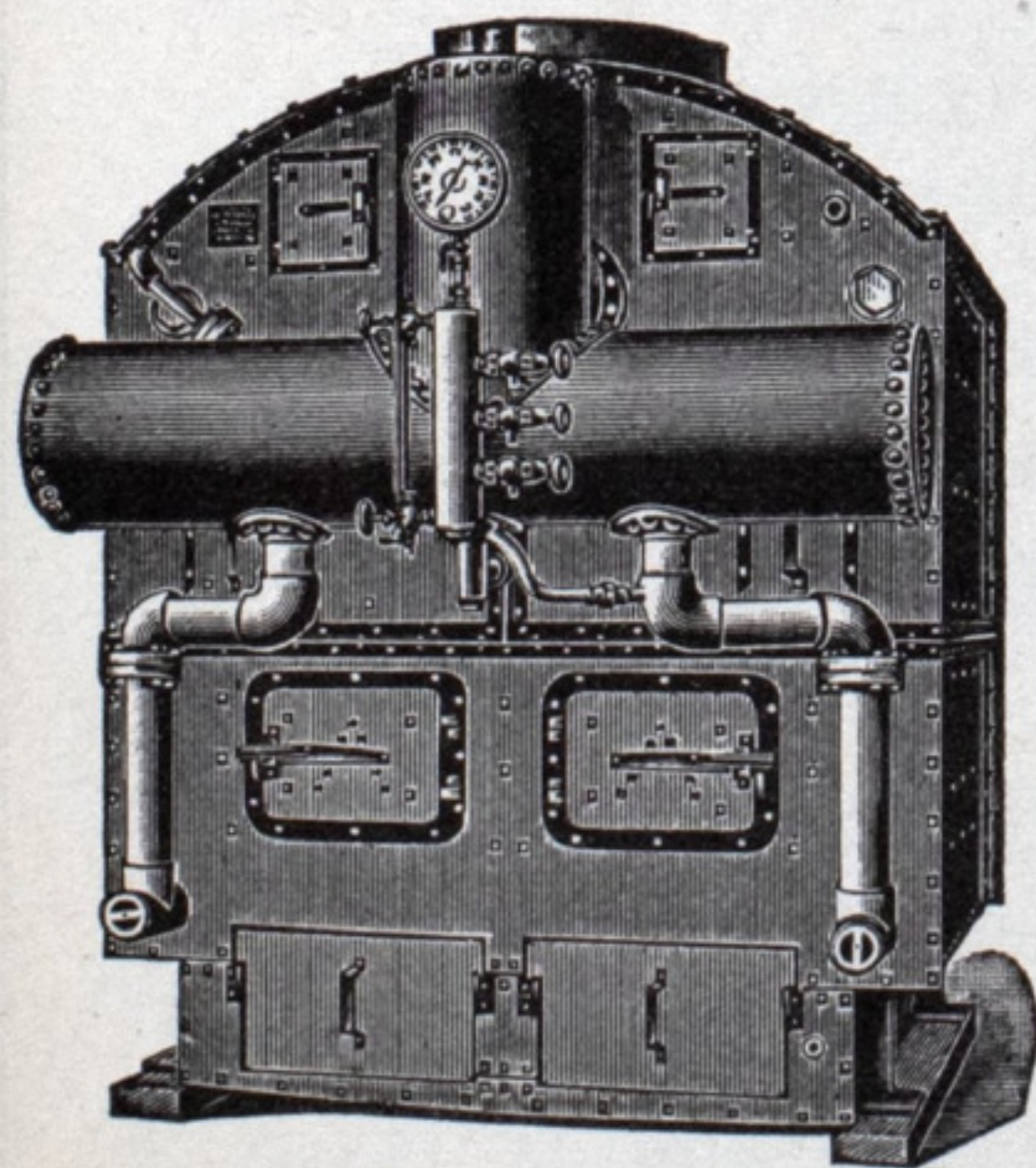


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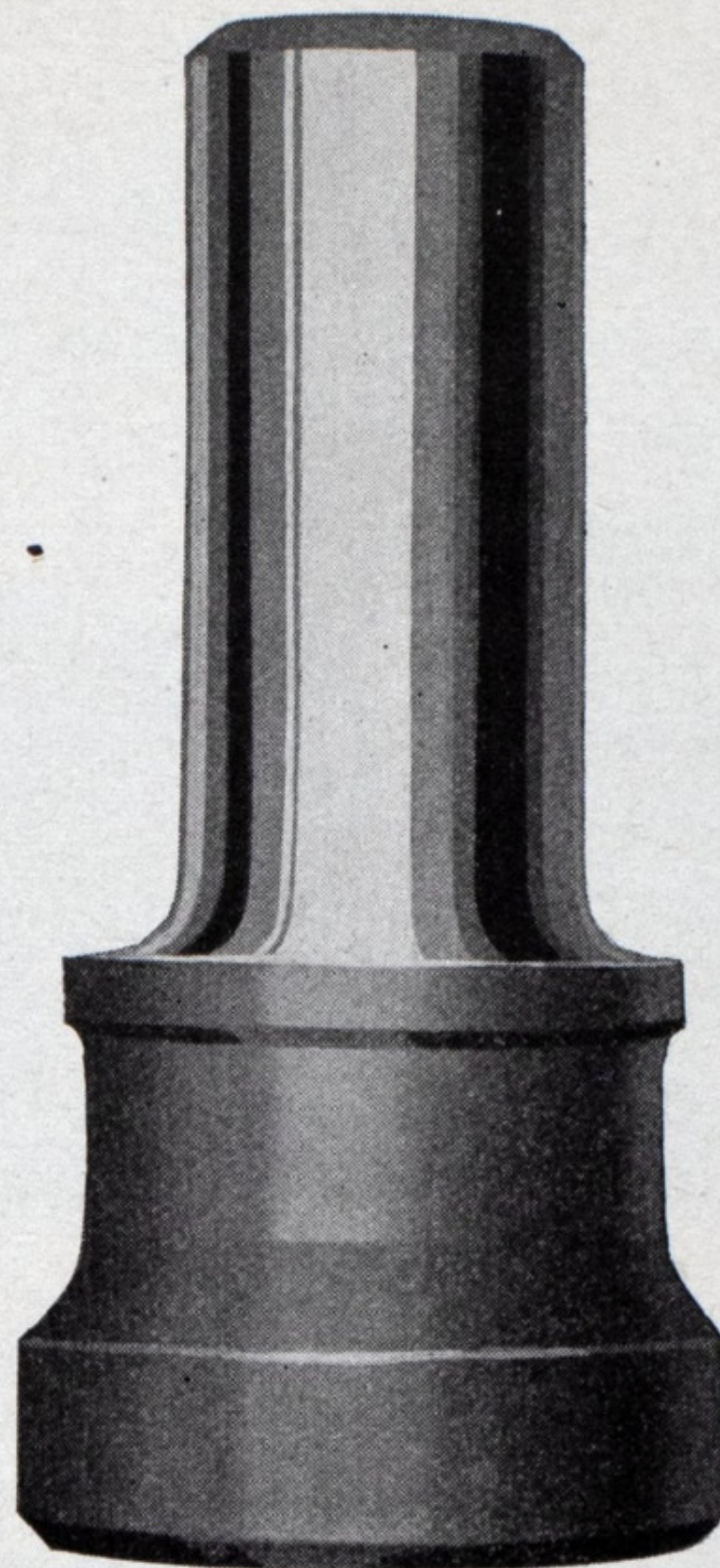
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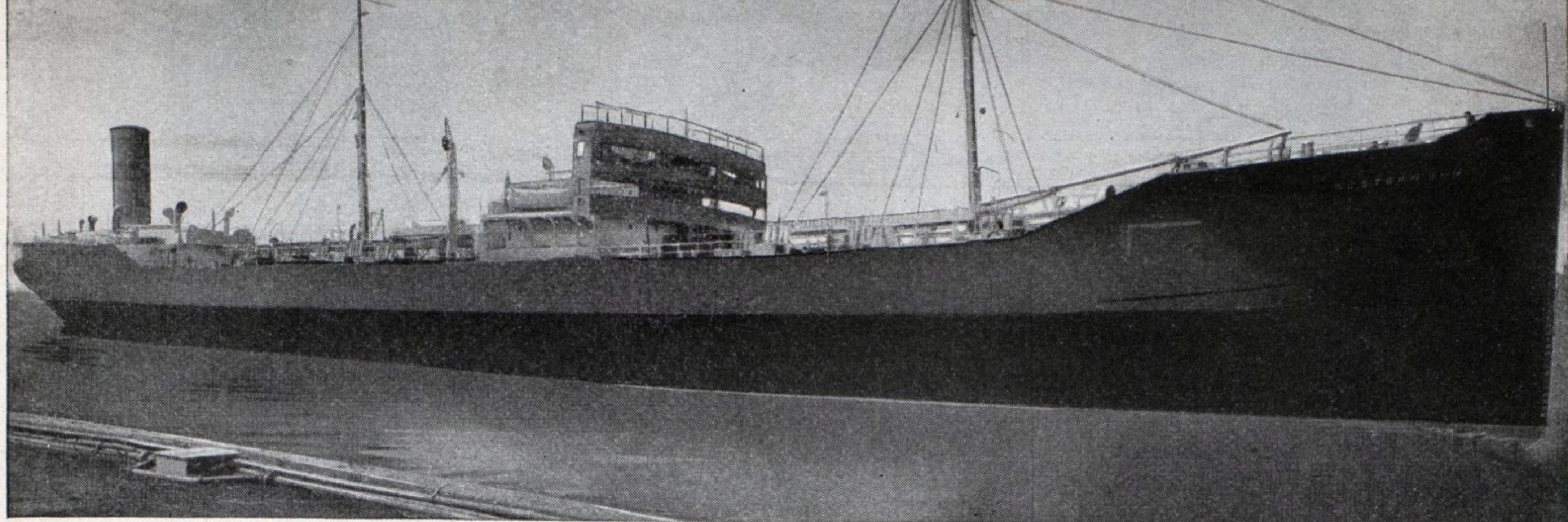
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INDEX TO ADVERTISERS

Almy Water Tube Boiler Co... 71	Federal Shipbuilding & Dry Dock Co..... 10	Oldman-Magee Boiler Works, Inc..... 69
American Engineering Co., The 73		
American Ship Building Co... 7		
	General Electric Co..... 11	Ritchie, E. S. & Sons..... 63
Babcock & Wilcox Co.....	Goodrich, B. F., Rubber Co... 8, 9	
Bethlehem Shipbuilding Corp., Ltd.....	Great Lakes Engineering Wks. 12	
Boland & Cornelius..... 69	Griscom-Russell Co., The..... 69	
Brunswick-Kroeschell Co.....		Samson Cordage Works..... 69
	Hamburg-American Lines..... 69	Sharples Specialty Co., The... ..
	Hyde Windlass Co..... Back Cover	Sheriffs Manufacturing Co.... 71
Carnegie Steel Company..... 67		Smith, Leathem D., Dock Co. ..
Charleston Dry Dock & Machine Co..... 60	Isherwood, Sir Joseph W., & Co., Ltd..... 62	Sperry Gyroscope Co..... 61
Clark Trutractor Co..... 49		Stamford Foundry Co..... 60
Cleveland & Buffalo Transit Co..... 71	Jerguson Gage & Valve Co.... 67	Star Brass Mfg. Co..... 63
Coen Co., Inc..... 74		Stratford, Geo., Oakum Co... 69
Columbian Rope Co..... 6		Sturtevant, B. F., Co. Back Cover
Cooper-Bessemer Corp., The.. 57		Sun Shipbuilding & Dry Dock Co..... 59
Crandall Engineering Co., The 62		Superior Mfg. Co..... 65
Cutler-Hammer, Inc.....		
		Todd Shipyards Corp. Front Cover
		Troy Engine & Machine Co... 3
Dake Engine Co..... 62	Lane, C. M. Lifeboat Co., Inc. 60	
Davis Engineering Corporation 60		United Dry Docks, Inc.....
Dean Brothers Co..... 65		
DeLaval Steam Turbine Co... ..	McIntosh & Seymour Corp... 65	
Diehl Mfg. Co.....	MacGregor & King, Ltd..... 60	Vacuum Oil Co..... 4
	Manitowoc Shipbuilding Corp. 63	
	Maryland Dry Dock Co..... 62	
	Morse, Andrew J., & Son, Inc. 71	
Electric Storage Battery Co. Front Cover 51		Warren Steam Pump Co.....
Elwell-Parker Electric Co., The 53		Westinghouse Air Brake Co... ..
		Westinghouse Electric & Mfg. Co..... 55
	Neely Nut & Bolt Co.....	White, Kelvin & Wilfrid O., Co. 69
	Newport News Shipbuilding & Dry Dock Co. Inside Back Cover	Wilcox-Rich Corp..... 71
Fairbanks, Morse & Co.....	New York Shipbuilding Co. Inside Front Cover	Whitlock Cordage Co..... 67
Farley, Edward P. & Co., Inc.. 69		

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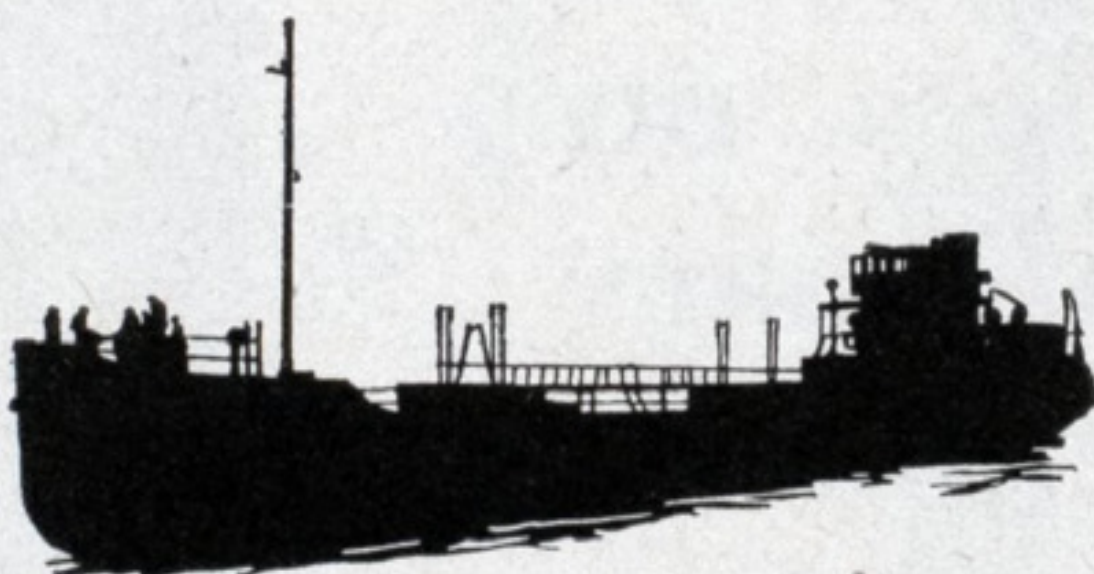
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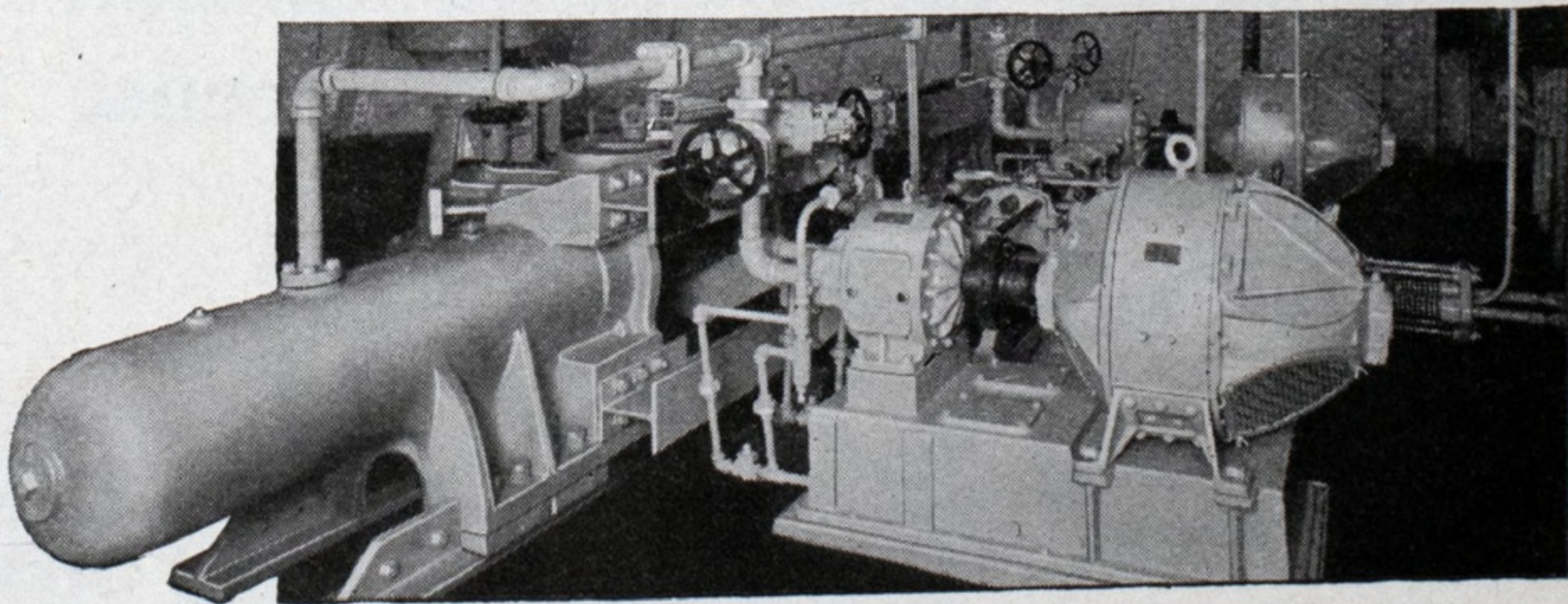
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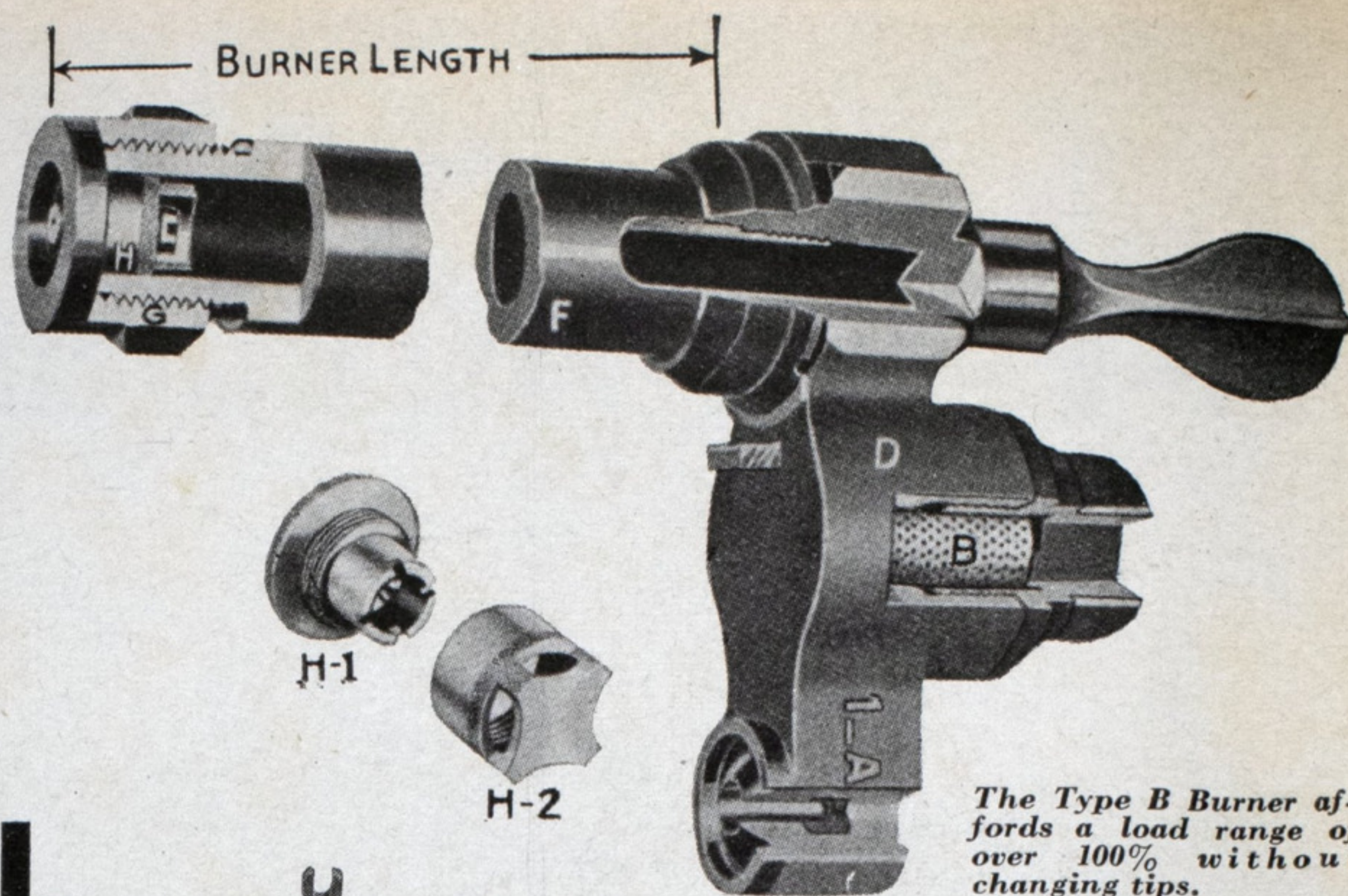
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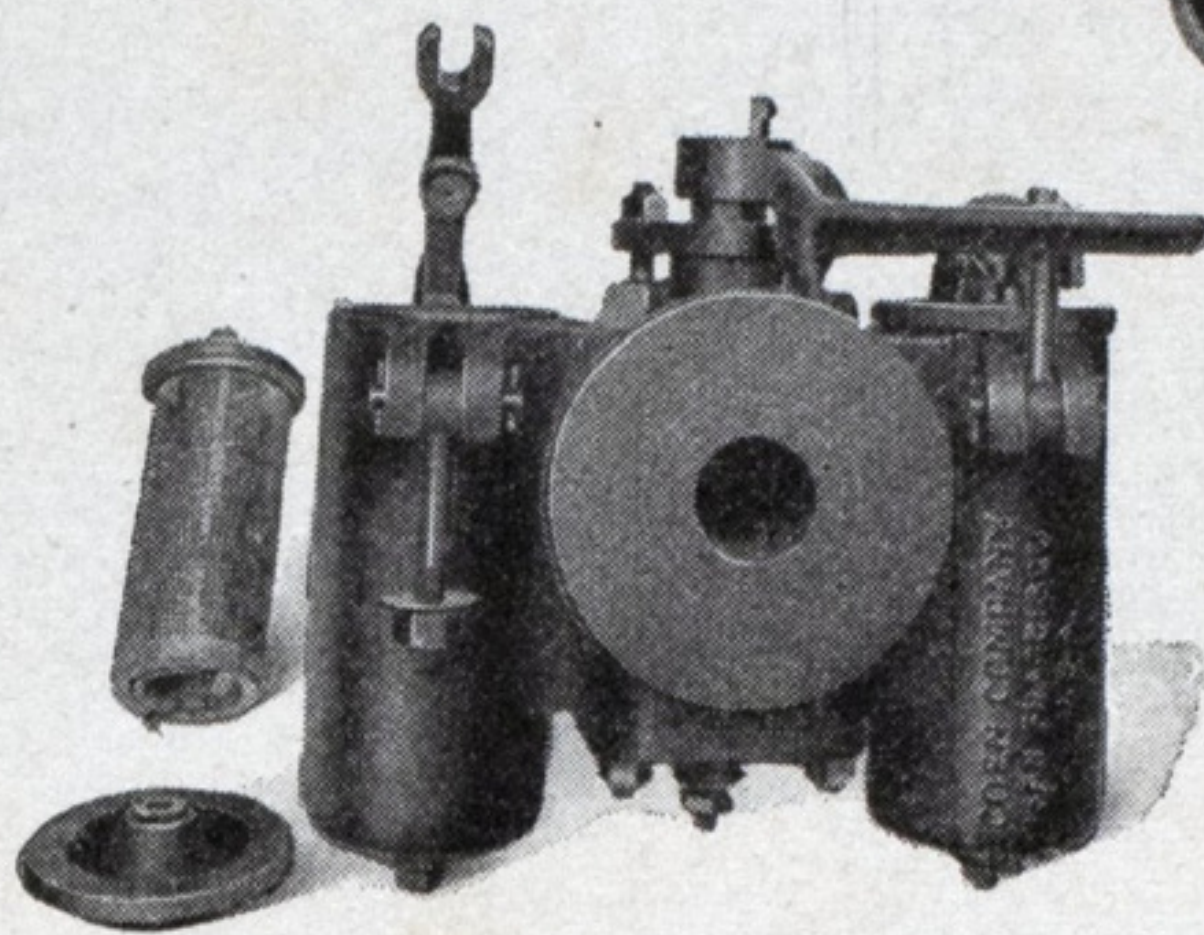


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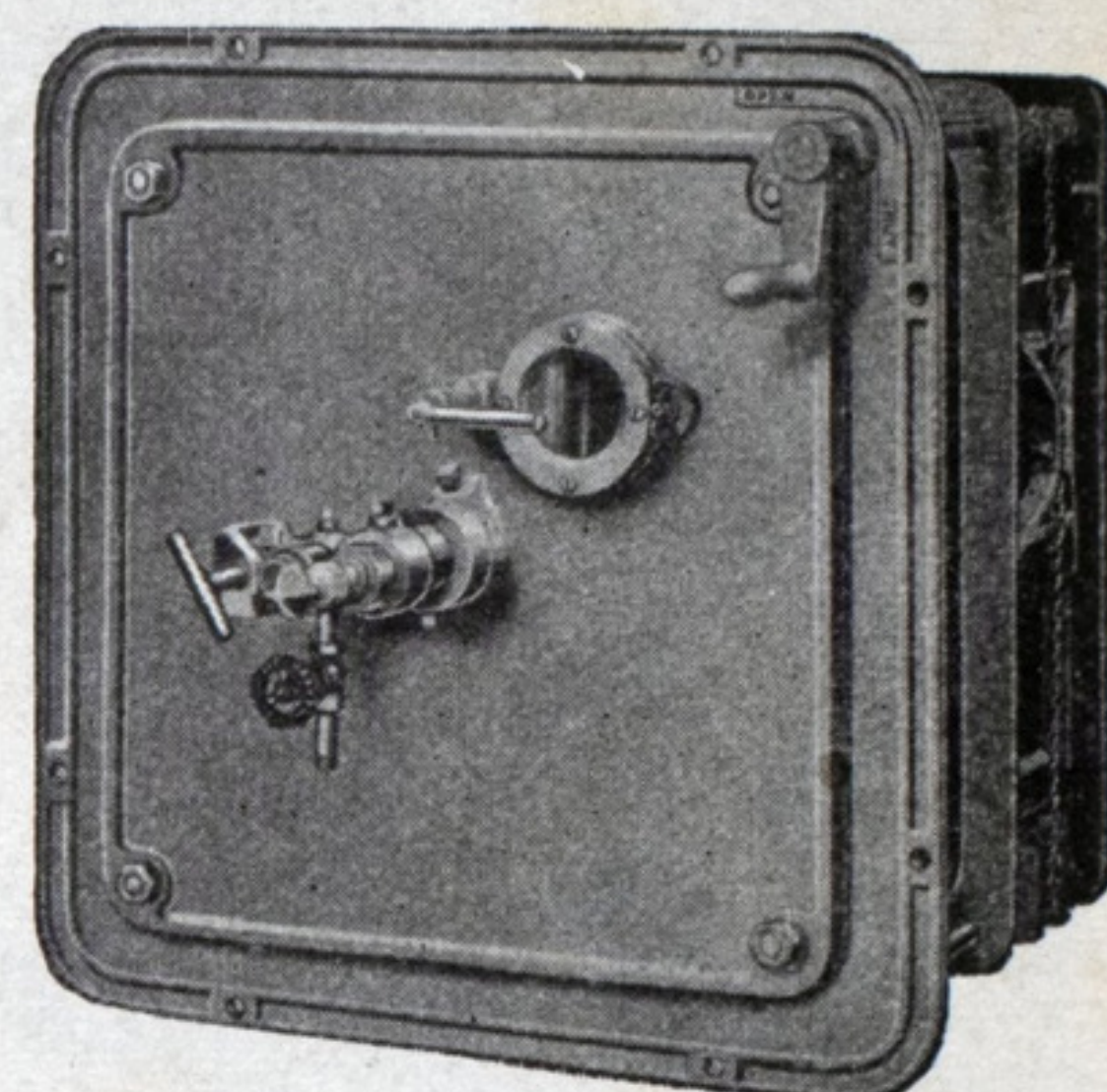
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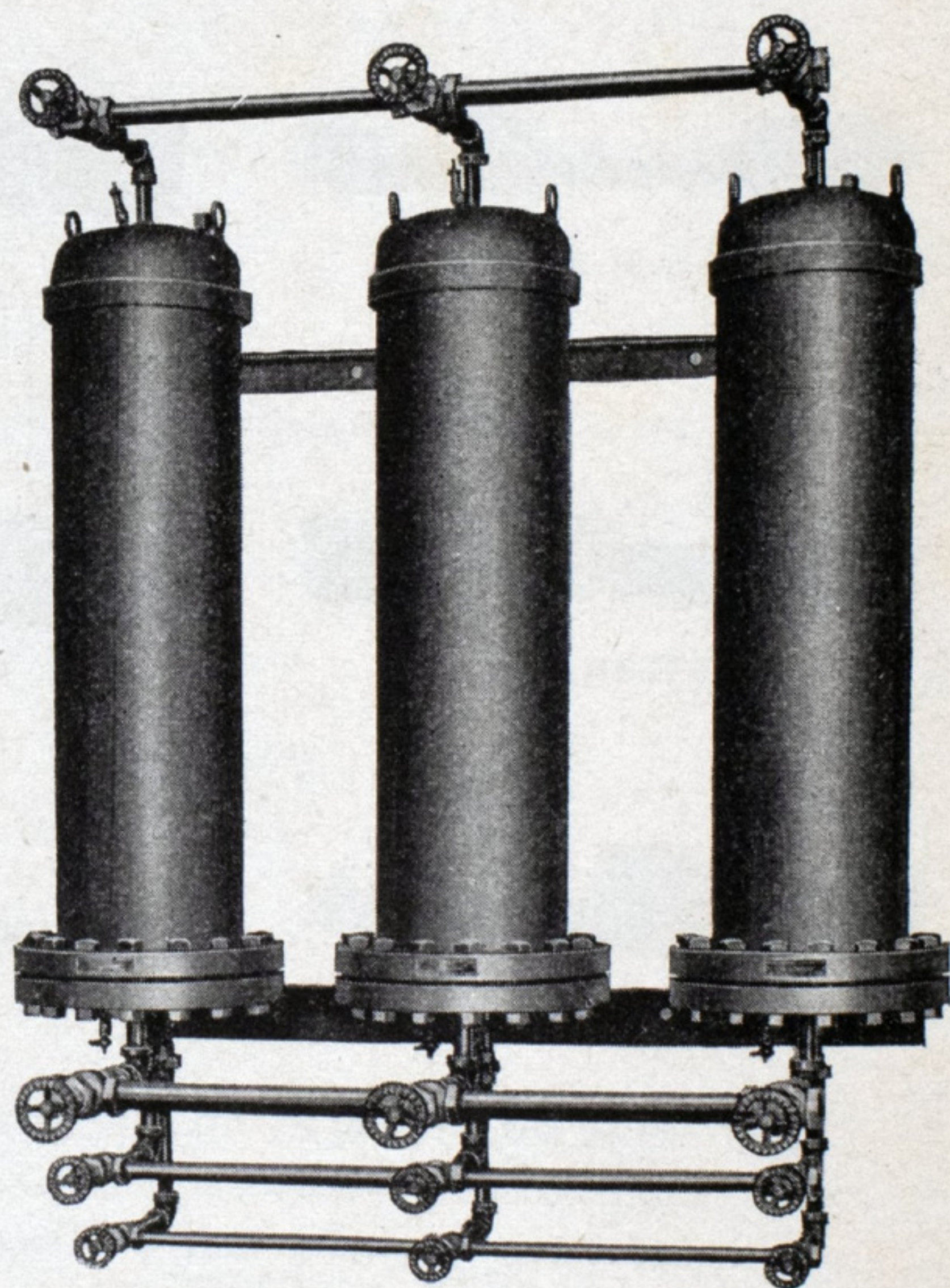
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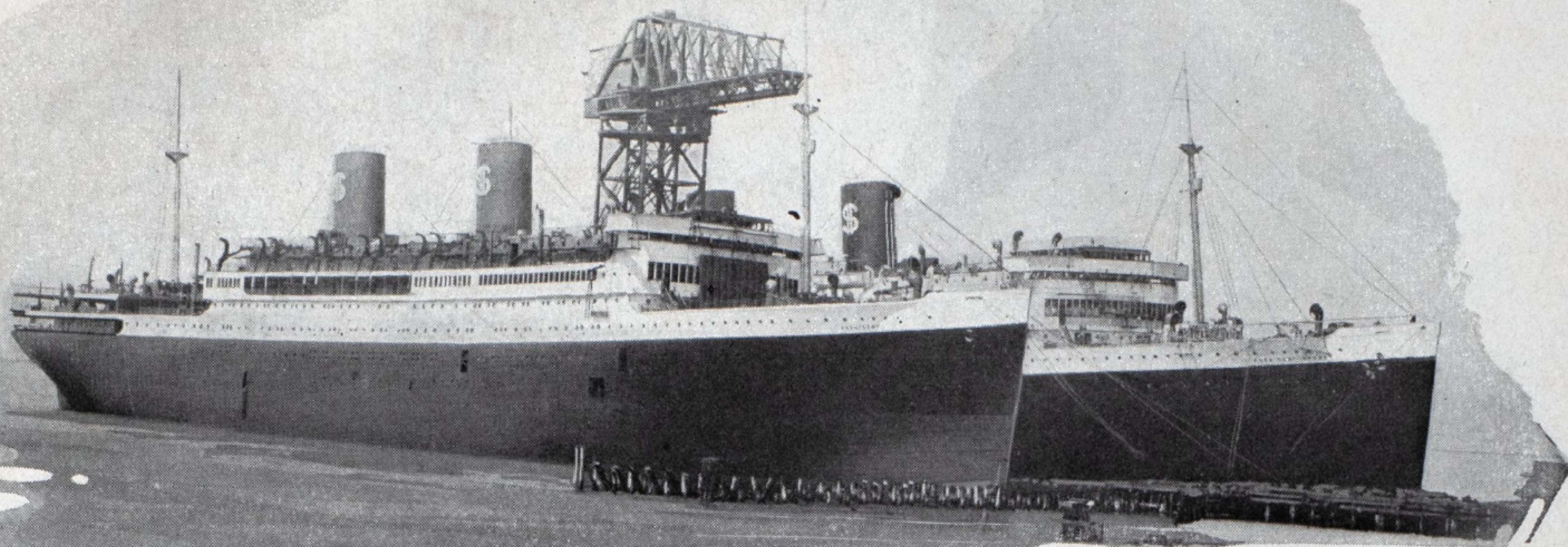
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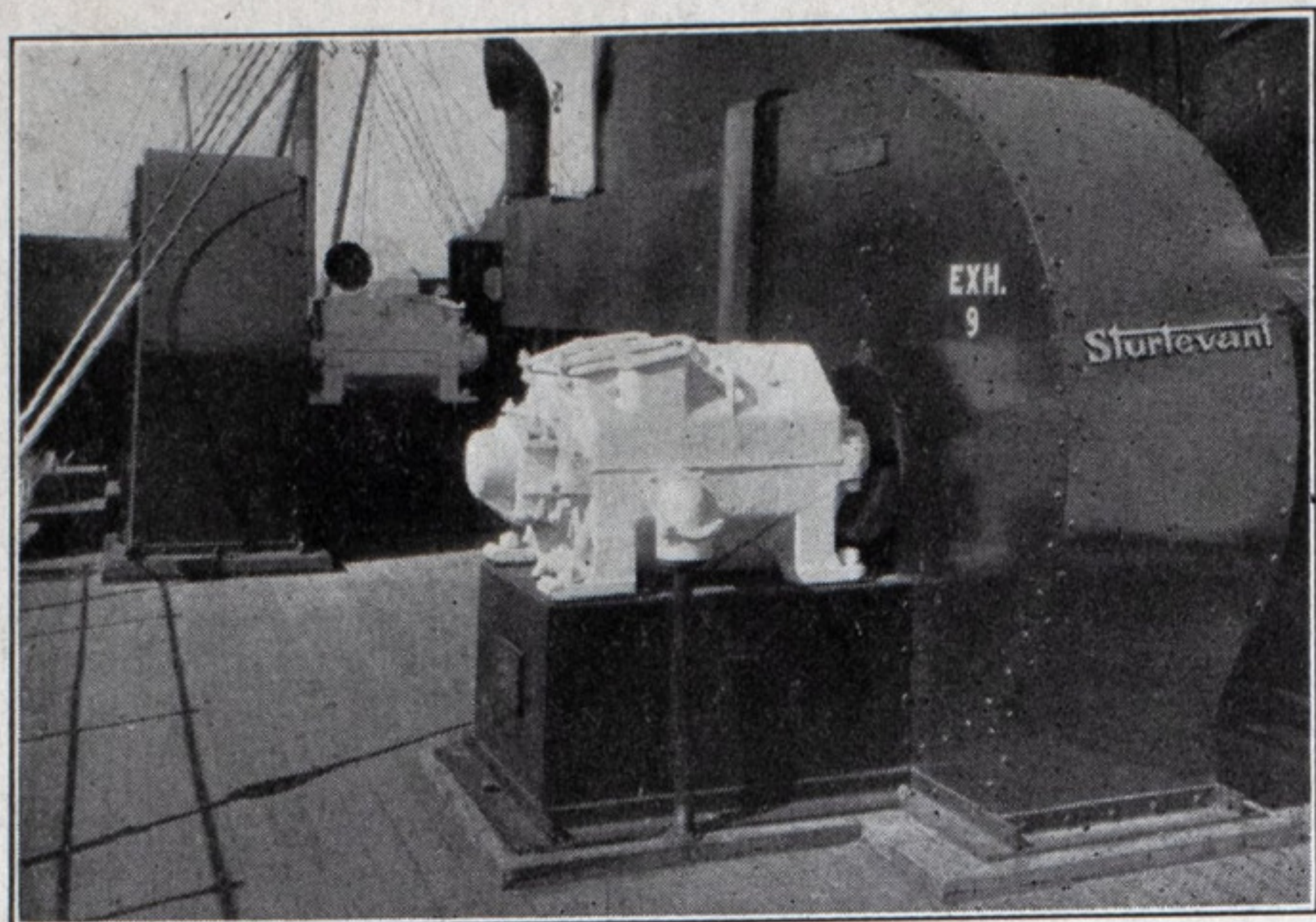
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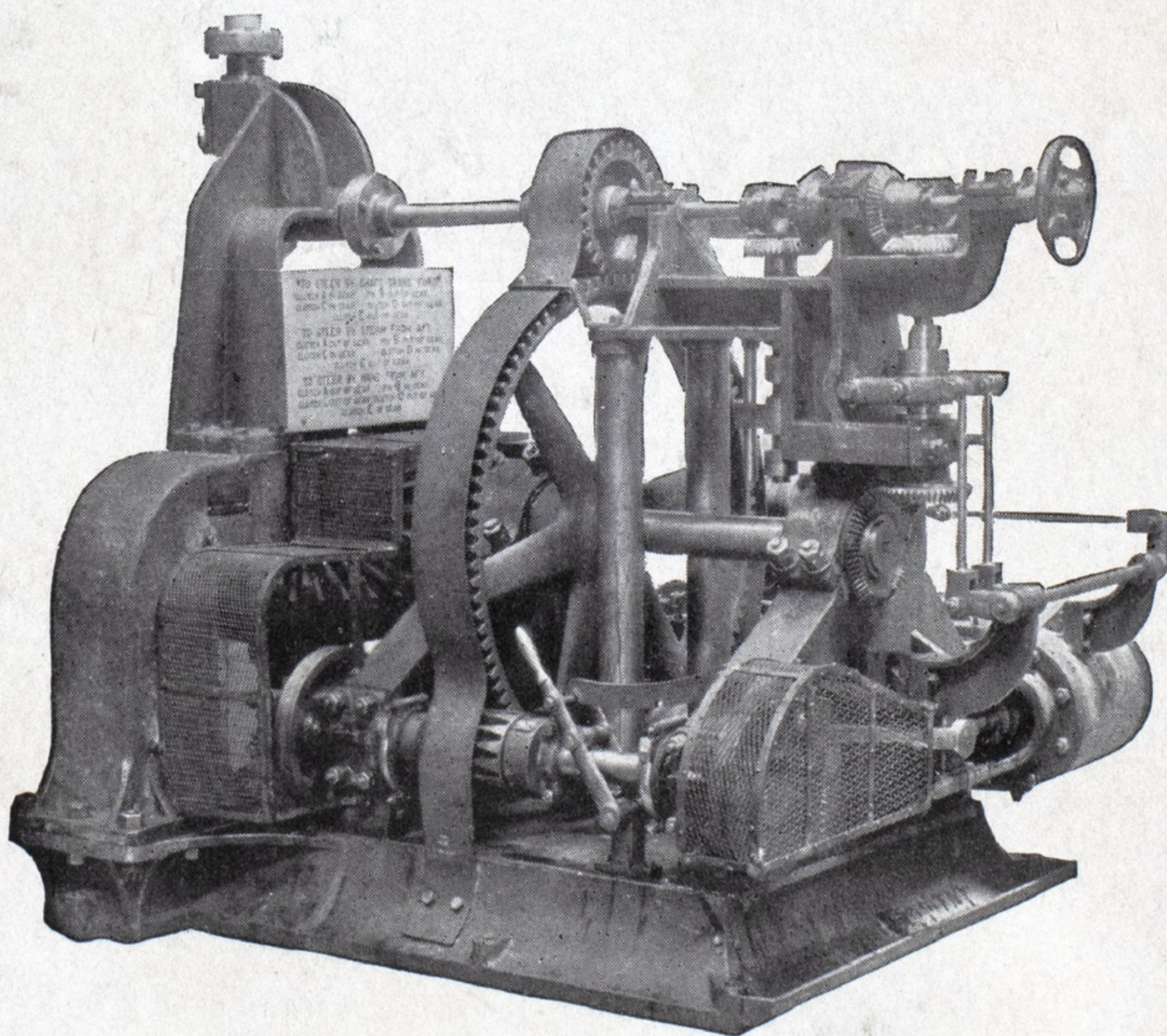
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